

TEAM WORLDWIDE CORPORATION V. ACADEMY, LTD., et al.

Lead Case No. 2:19-cv-00092-JRG-RSP

CONSOLIDATED DEFENDANTS' MOTION FOR
PARTIAL SUMMARY JUDGMENT ON MARKING

EXHIBIT 5

Fill in this information to identify the case (Select only one Debtor per claim form):

<input type="checkbox"/> Sears Holdings Corporation (18-23538)	<input type="checkbox"/> Kmart Corporation (18-23549)	<input type="checkbox"/> Sears, Roebuck de Puerto Rico, Inc. (18-23561)	<input type="checkbox"/> MyGofer LLC (18-23573)	<input type="checkbox"/> Kmart.com LLC (18-23585)
<input checked="" type="checkbox"/> Sears, Roebuck and Co. (18-23537)	<input type="checkbox"/> MaxServ, Inc. (18-23550)	<input type="checkbox"/> SYW Relay LLC (18-23562)	<input type="checkbox"/> Sears Brands Business Unit Corporation (18-23574)	<input type="checkbox"/> Sears Brands Management Corporation (18-23586)
<input type="checkbox"/> Kmart Holding Corporation (18-23539)	<input type="checkbox"/> Private Brands, Ltd. (18-23551)	<input type="checkbox"/> Wally Labs LLC (18-23563)	<input type="checkbox"/> Sears Holdings Publishing Company, LLC (18-23575)	<input type="checkbox"/> SHC Licensed Business LLC (18-23616)
<input type="checkbox"/> Kmart Operations LLC (18-23540)	<input type="checkbox"/> Sears Development Co. (18-23552)	<input type="checkbox"/> Big Beaver of Florida Development, LLC (18-23564)	<input type="checkbox"/> Kmart of Michigan, Inc. (18-23576)	<input type="checkbox"/> SHC Promotions LLC (18-23630)
<input type="checkbox"/> Sears Operations LLC (18-23541)	<input type="checkbox"/> Sears Holdings Management Corporation (18-23553)	<input type="checkbox"/> California Builder Appliances, Inc. (18-23565)	<input type="checkbox"/> SHC Desert Springs, LLC (18-23577)	<input type="checkbox"/> SRe Holding Corporation (19-22301)
<input type="checkbox"/> ServiceLive, Inc. (18-23542)	<input type="checkbox"/> Sears Home & Business Franchises, Inc. (18-23554)	<input type="checkbox"/> Florida Builder Appliances, Inc. (18-23566)	<input type="checkbox"/> SOE, Inc. (18-23578)	
<input type="checkbox"/> A&E Factory Service, LLC (18-23543)	<input type="checkbox"/> Sears Home Improvement Products, Inc. (18-23555)	<input type="checkbox"/> KBL Holding Inc. (18-23567)	<input type="checkbox"/> StarWest, LLC (18-23579)	
<input type="checkbox"/> A&E Home Delivery, LLC (18-23544)	<input type="checkbox"/> Sears Insurance Services, L.L.C. (18-23556)	<input type="checkbox"/> KLC, Inc. (18-23568)	<input type="checkbox"/> STI Merchandising, Inc. (18-23580)	
<input type="checkbox"/> A&E Lawn & Garden, LLC (18-23545)	<input type="checkbox"/> Sears Procurement Services, Inc. (18-23557)	<input type="checkbox"/> Sears Protection Company (Florida), L.L.C. (18-23569)	<input type="checkbox"/> Troy Coolidge No. 13, LLC (18-23581)	
<input type="checkbox"/> A&E Signature Service, LLC (18-23546)	<input type="checkbox"/> Sears Protection Company (18-23558)	<input type="checkbox"/> Kmart of Washington LLC (18-23570)	<input type="checkbox"/> BlueLight.com, Inc. (18-23582)	
<input type="checkbox"/> FBA Holdings Inc. (18-23547)	<input type="checkbox"/> Sears Protection Company (PR) Inc. (18-23559)	<input type="checkbox"/> Kmart Stores of Illinois LLC (18-23571)	<input type="checkbox"/> Sears Brands, L.L.C. (18-23583)	
<input type="checkbox"/> Innovel Solutions, Inc. (18-23548)	<input type="checkbox"/> Sears Roebuck Acceptance Corp. (18-23560)	<input type="checkbox"/> Kmart Stores of Texas LLC (18-23572)	<input type="checkbox"/> Sears Buying Services, Inc. (18-23584)	

Exhibit 18**Proof of Claim**

04/16

Read the instructions before filling out this form. This form is for making a claim for payment in a bankruptcy case. Do not use this form to make a request for payment of an administrative expense, other than a claim entitled to administrative priority pursuant to 11 U.S.C. § 503(b)(9). Make such a request according to 11 U.S.C. § 503.

Filers must leave out or redact information that is entitled to privacy on this form or on any attached documents. Attach redacted copies of any documents that support the claim, such as promissory notes, purchase orders, invoices, itemized statements of running accounts, contracts, judgments, mortgages, and security agreements. **Do not send original documents;** they may be destroyed after scanning. If the documents are not available, explain in an attachment.

A person who files a fraudulent claim could be fined up to \$500,000, imprisoned for up to 5 years, or both. 18 U.S.C. §§ 152, 157, and 3571.

Fill in all the information about the claim as of the date the case was filed. That date is on the notice of bankruptcy (Form 309) that you received.

Part 1: Identify the Claim

1. Who is the current creditor?	Team Worldwide Corporation Name of the current creditor (the person or entity to be paid for this claim) Other names the creditor used with the debtor _____	
2. Has this claim been acquired from someone else?	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes. From whom? _____	
3. Where should notices and payments to the creditor be sent? Federal Rule of Bankruptcy Procedure (FRBP) 2002(g)	Where should notices to the creditor be sent? Diamond McCarthy LLP Attn: A. Diamond 295 Madison Avenue, 27th Floor New York, NY 10017 Contact phone 212-430-5400 Contact email adiamond@diamondmccarthy.com	Where should payments to the creditor be sent? (if different) Contact phone _____ Contact email _____
4. Does this claim amend one already filed?	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes. Claim number on court claims registry (if known) _____ Filed on _____ MM / DD / YYYY	
5. Do you know if anyone else has filed a proof of claim for this claim?	<input checked="" type="checkbox"/> No <input type="checkbox"/> Yes. Who made the earlier filing? _____	

Part 2: Give Information About the Claim as of the Date the Case Was Filed

6. Do you have any number you use to identify the debtor? ☒ No
☐ Yes. Last 4 digits of the debtor's account or any number you use to identify the debtor: _____

7. How much is the claim? \$ See Rider . Does this amount include interest or other charges?
☒ No
☐ Yes. Attach statement itemizing interest, fees, expenses, or other charges required by Bankruptcy Rule 3001(c)(2)(A).

8. What is the basis of the claim? Examples: Goods sold, money loaned, lease, services performed, personal injury or wrongful death, or credit card.
Attach redacted copies of any documents supporting the claim required by Bankruptcy Rule 3001(c).
Limit disclosing information that is entitled to privacy, such as health care information.

9. Is all or part of the claim secured? ☒ No
☐ Yes. The claim is secured by a lien on property.

Nature of property:

☐ Real estate. If the claim is secured by the debtor's principal residence, file a *Mortgage Proof of Claim Attachment* (Official Form 410-A) with this *Proof of Claim*.

☐ Motor vehicle

☐ Other. Describe: _____

Basis for perfection: _____

Attach redacted copies of documents, if any, that show evidence of perfection of a security interest (for example, a mortgage, lien, certificate of title, financing statement, or other document that shows the lien has been filed or recorded.)

Value of property: \$ _____

Amount of the claim that is secured: \$ _____

Amount of the claim that is unsecured: \$ _____ (The sum of the secured and unsecured amounts should match the amount in line 7.)

Amount necessary to cure any default as of the date of the petition: \$ _____

Annual Interest Rate (when case was filed) _____ %

☐ Fixed

☐ Variable

10. Is this claim based on a lease? ☒ No
☐ Yes. Amount necessary to cure any default as of the date of the petition. \$ _____

11. Is this claim subject to a right of setoff? ☒ No
☐ Yes. Identify the property: _____

<p>12. Is all or part of the claim entitled to priority under 11 U.S.C. § 507(a)?</p> <p>A claim may be partly priority and partly nonpriority. For example, in some categories, the law limits the amount entitled to priority.</p>	<p><input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes. Check one:</p> <p><input type="checkbox"/> Domestic support obligations (including alimony and child support) under 11 U.S.C. § 507(a)(1)(A) or (a)(1)(B).</p> <p><input type="checkbox"/> Up to \$2,850* of deposits toward purchase, lease, or rental of property or services for personal, family, or household use. 11 U.S.C. § 507(a)(7).</p> <p><input type="checkbox"/> Wages, salaries, or commissions (up to \$12,850*) earned within 180 days before the bankruptcy petition is filed or the debtor's business ends, whichever is earlier. 11 U.S.C. § 507(a)(4).</p> <p><input type="checkbox"/> Taxes or penalties owed to governmental units. 11 U.S.C. § 507(a)(8).</p> <p><input type="checkbox"/> Contributions to an employee benefit plan. 11 U.S.C. § 507(a)(5).</p> <p><input type="checkbox"/> Other. Specify subsection of 11 U.S.C. § 507(a)() that applies.</p>	<p>Amount entitled to priority</p> <p>\$ _____</p> <p>\$ _____</p> <p>\$ _____</p> <p>\$ _____</p> <p>\$ _____</p> <p>\$ _____</p>
<p>* Amounts are subject to adjustment on 4/01/19 and every 3 years after that for cases begun on or after the date of adjustment.</p>		
<p>13. Is all or part of the claim entitled to administrative priority pursuant to 11 U.S.C. § 503(b)(9)?</p>	<p><input checked="" type="checkbox"/> No</p> <p><input type="checkbox"/> Yes. Indicate the amount of your claim arising from the value of any goods received by the Debtor within 20 days before the date of commencement of the above case, in which the goods have been sold to the Debtor in the ordinary course of such Debtor's business. Attach documentation supporting such claim.</p>	<p>\$ _____</p>

Part 3: Sign Below

The person completing this proof of claim must sign and date it. FRBP 9011(b).

If you file this claim electronically, FRBP 5005(a)(2) authorizes courts to establish local rules specifying what a signature is.

A person who files a fraudulent claim could be fined up to \$500,000, imprisoned for up to 5 years, or both. 18 U.S.C. §§ 152, 157, and 3571.

Check the appropriate box:

- ☒ I am the creditor.
- ☐ I am the creditor's attorney or authorized agent.
- ☐ I am the trustee, or the debtor, or their authorized agent. Bankruptcy Rule 3004.
- ☐ I am a guarantor, surety, endorser, or other codebtor. Bankruptcy Rule 3005.

I understand that an authorized signature on this *Proof of Claim* serves as an acknowledgment that when calculating the amount of the claim, the creditor gave the debtor credit for any payments received toward the debt.

I have examined the information in this *Proof of Claim* and have a reasonable belief that the information is true and correct.

I declare under penalty of perjury that the foregoing is true and correct.

Signature: Kenneth Wang
Kenneth Wang (Apr 10, 2019)

Email: ken.wang@twwcorp.com

Signature

Print the name of the person who is completing and signing this claim:

Name of the person who is completing and signing this claim:

Name	<u>Kenneth Wang</u>		
	First name	Middle name	Last name
Title	<u>General Manager</u>		
Company	<u>Team Worldwide Corporation</u>		
	Identify the corporate servicer as the company if the authorized agent is a servicer.		
Address	<u>9F., No. 24, Songzhi Road</u>		
	Number	Street	
	<u>Xini Dist. Taipei City 110 Taiwan R.O.C.</u>		
	City	State	ZIP Code
Contact phone	<u>+86-1893-323-7699</u>	Email	<u>ken.wang@twwcorp.com</u>

Attach Supporting Documentation (limited to a single PDF attachment that is less than 5 megabytes in size and under 100 pages):

☒ have supporting documentation.
(attach below)

☐ do not have supporting documentation.



Attachment

PLEASE REVIEW YOUR PROOF OF CLAIM AND SUPPORTING DOCUMENTS AND REDACT ACCORDINGLY PRIOR TO UPLOADING THEM. PROOFS OF CLAIM AND ATTACHMENTS ARE PUBLIC DOCUMENTS THAT WILL BE AVAILABLE FOR ANYONE TO VIEW ONLINE.

IMPORTANT NOTE REGARDING REDACTING YOUR PROOF OF CLAIM AND SUPPORTING DOCUMENTATION When you submit a proof of claim and any supporting documentation you must show only the last four digits of any social-security, individual's tax-identification, or financial-account number, only the initials of a minor's name, and only the year of any person's date of birth. If the claim is based on the delivery of health care goods or services, limit the disclosure of the goods or services so as to avoid embarrassment or the disclosure of confidential health care information.

A document has been redacted when the person filing it has masked, edited out, or otherwise deleted, certain information. The responsibility for redacting personal data identifiers (as defined in Federal Rule of Bankruptcy Procedure 9037) rests solely with the party submitting the documentation and their counsel. Prime Clerk and the Clerk of the Court will not review any document for redaction or compliance with this Rule and you hereby release and agree to hold harmless Prime Clerk and the Clerk of the Court from the disclosure of any personal data identifiers included in your submission. In the event Prime Clerk or the Clerk of the Court discover that personal identifier data or information concerning a minor individual has been included in a pleading, Prime Clerk and the Clerk of the Court are authorized, in their sole discretion, to redact all such information from the text of the filing and make an entry indicating the correction.

Modified Form 410

Instructions for Proof of Claim

United States Bankruptcy Court

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These instructions and definitions generally explain the law. In certain circumstances, such as bankruptcy cases that debtors do not file voluntarily, exceptions to these general rules may apply. You should consider obtaining the advice of an attorney, especially if you are unfamiliar with the bankruptcy process and privacy regulations.

A person who files a fraudulent claim could be fined up to \$500,000, imprisoned for up to 5 years, or both.
18 U.S.C. §§ 152, 157 and 3571.

How to fill out this form

- Fill in all of the information about the claim as of the date the case was filed.
- Fill in the caption at the top of the form.
- If the claim has been acquired from someone else, then state the identity of the last party who owned the claim or was the holder of the claim and who transferred it to you before the initial claim was filed.
- Attach any supporting documents to this form.
Attach redacted copies of any documents that show that the debt exists, a lien secures the debt, or both. (See the definition of *redaction* on the next page.)
Also attach redacted copies of any documents that show perfection of any security interest or any assignments or transfers of the debt. In addition to the documents, a summary may be added. Federal Rule of Bankruptcy Procedure (called “Bankruptcy Rule”) 3001(c) and (d).
- Do not attach original documents because attachments may be destroyed after scanning.
- If the claim is based on delivering health care goods or services, do not disclose confidential health care information. Leave out or redact confidential information both in the claim and in the attached documents.

- A *Proof of Claim* form and any attached documents must show only the last 4 digits of any social security number, individual’s tax identification number, or financial account number, and only the year of any person’s date of birth. See Bankruptcy Rule 9037.
- For a minor child, fill in only the child’s initials and the full name and address of the child’s parent or guardian. For example, write *A.B., a minor child (John Doe, parent, 123 Main St., City, State)*. See Bankruptcy Rule 9037.

Confirmation that the claim has been filed

To receive confirmation that the claim has been filed, either enclose a stamped self-addressed envelope and a copy of this form. You may view a list of filed claims in this case by visiting the Claims and Noticing Agent’s website at <http://restructuring.primeclerk.com/sears>.

Understand the terms used in this form

Administrative expense: Generally, an expense that arises after a bankruptcy case is filed in connection with operating, liquidating, or distributing the bankruptcy estate.
11 U.S.C. § 503.

Claim: A creditor’s right to receive payment for a debt that the debtor owed on the date the debtor filed for bankruptcy.
11 U.S.C. § 101 (5). A claim may be secured or unsecured.

Claim Pursuant to 11 U.S.C. §503(b)(9): A claim arising from the value of any goods received by the Debtor within 20 days before the date of commencement of the above case, in which the goods have been sold to the Debtor in the ordinary course of the Debtor's business. Attach documentation supporting such claim.

Creditor: A person, corporation, or other entity to whom a debtor owes a debt that was incurred on or before the date the debtor filed for bankruptcy. 11 U.S.C. §101 (10).

Debtor: A person, corporation, or other entity who is in bankruptcy. Use the debtor's name and case number as shown in the bankruptcy notice you received. 11 U.S.C. § 101 (13).

Evidence of perfection: Evidence of perfection of a security interest may include documents showing that a security interest has been filed or recorded, such as a mortgage, lien, certificate of title, or financing statement.

Information that is entitled to privacy: A *Proof of Claim* form and any attached documents must show only the last 4 digits of any social security number, an individual's tax identification number, or a financial account number, only the initials of a minor's name, and only the year of any person's date of birth. If a claim is based on delivering health care goods or services, limit the disclosure of the goods or services to avoid embarrassment or disclosure of confidential health care information. You may later be required to give more information if the trustee or someone else in interest objects to the claim.

Priority claim: A claim within a category of unsecured claims that is entitled to priority under 11 U.S.C. §507(a). These claims are paid from the available money or property in a bankruptcy case before other unsecured claims are paid. Common priority unsecured claims include alimony, child support, taxes, and certain unpaid wages.

Proof of claim: A form that shows the amount of debt the debtor owed to a creditor on the date of the bankruptcy filing. The form must be filed in the district where the case is pending.

Redaction of information: Masking, editing out, or deleting certain information to protect privacy. Filers must redact or leave out information entitled to **privacy** on the *Proof of Claim* form and any attached documents.

Secured claim under 11 U.S.C. §506(a): A claim backed by a lien on particular property of the debtor. A claim is secured to the extent that a creditor has the right to be paid from the property before other creditors are paid. The amount of a secured claim usually cannot be more than the value of the particular property on which the creditor has a lien. Any amount owed to a creditor that is more than the value of the property normally may be an unsecured claim. But exceptions exist; for example, see 11 U.S.C. § 1322(b) and the final sentence of 1325(a).

Examples of liens on property include a mortgage on real estate or a security interest in a car. A lien may be voluntarily granted by a debtor or may be obtained through a court proceeding. In some states, a court judgment may be a lien.

Setoff: Occurs when a creditor pays itself with money belonging to the debtor that it is holding, or by canceling a debt it owes to the debtor.

Unsecured claim: A claim that does not meet the requirements of a secured claim. A claim may be unsecured in part to the extent that the amount of the claim is more than the value of the property on which a creditor has a lien.

Offers to purchase a claim

Certain entities purchase claims for an amount that is less than the face value of the claims. These entities may contact creditors offering to purchase their claims. Some written communications from these entities may easily be confused with official court documentation or communications from the debtor. These entities do not represent the bankruptcy court, the bankruptcy trustee, or the debtor. A creditor has no obligation to sell its claim. However, if a creditor decides to sell its claim, any transfer of that claim is subject to Bankruptcy Rule 3001(e), any provisions of the Bankruptcy Code (11 U.S.C. § 101 et seq.) that apply, and any orders of the bankruptcy court that apply.

Please send completed Proof(s) of Claim to:

Sears Holdings Corporation Claims Processing Center
c/o Prime Clerk LLC
850 3rd Avenue, Suite 412
Brooklyn, NY 11232

Do not file these instructions with your form
--

UNITED STATES BANKRUPTCY COURT
SOUTHERN DISTRICT OF NEW YORK

-----X
In re:

Chapter 11

SEARS HOLDING CORPORATION,

Case No. 18-23538 (RDD)

Debtor.
-----X

In re:

Chapter 11

SEARS, ROEBUCK AND CO.,

Case No. 18-23537 (RDD)

Debtor.
-----X

RIDER TO PROOF OF CLAIM OF TEAM WORLDWIDE CORPORATION

1. Basis for Claim

- a. This proof of claim (the “**Proof of Claim**”) is asserted by Team Worldwide Corporation (the “**Claimant**”) in the chapter 11 cases of Sears Holding Corporation (“**Sears Holding**”) Case No. 18-23538 (RDD), and Sears, Roebuck and Co. (“**Sears, Roebuck**” and together with Sears Holding, the “**Debtors**”), Case No. 18-23537 (RDD).
- b. This Proof of Claim arises from amounts owed to Claimant as a result of damages incurred due to Debtors’ selling and/or offering to sell infringing products and committing patent infringement under the patent laws of the United States, Title 35 of the United States Code.

2. Background.

- a. Claimant is a Taiwanese corporation which designs and manufactures inflatable products including, among others, inflatable mattresses generally known in the industry and to consumers as “air beds.” Claimant’s air bed products are sold under

multiple brands in the United States including Air Cloud™, ALPS Mountaineering®, Concierge Collection®, Cozelle®, EZ Bed™, Frontgate®, Grandin Road®, Improvements®, Insta Bed™, Ivation, Kelty®, Lazery Sleep™, Serta®, Simply Sleeper®, SoundAsleep, Swiss Gear®, and Wenzel® (“**Claimant Products**”).

- b. Claimant owns the following U.S. Patents: U.S. Pat. No. 7,246,394 (the “**’394 Patent**”), U.S. Pat. No. 7,346,950 (the “**’950 Patent**”), and U.S. Pat. No. 9,211,018 (the “**’018 Patent**”, collectively the “**Asserted Patents**”).
- c. The United States Patent and Trademark Office (“**USPTO**”) duly and lawfully issued to Claimant the ‘018 Patent, entitled “Inflatable Airbed Provided with Electric Pump Having Pump Body Recessed into the Inflatable Airbed,” on December 15, 2015. A true and correct copy of the ‘018 Patent is attached as **Exhibit A**. Claimant is the assignee of all rights, title, and interest in and to the ‘018 Patent and possesses the exclusive right of recovery, including the exclusive right to recover for past infringement.
- d. The USPTO duly and lawfully issued the ‘950 Patent, entitled “Inflatable Product Provided with Electric Air Pump,” on March 25, 2008. A true and correct copy of the ‘950 Patent is attached as **Exhibit B**. Claimant is the assignee of all rights, title, and interest in and to the ‘950 Patent and possesses the exclusive right of recovery, including the exclusive right to recover for past infringement.
- e. The USPTO duly and lawfully issued the ‘394 Patent, entitled “Inflatable Product with Built-In Housing and Switching Pipe,” on July 24, 2007. A true and correct copy of the ‘394 Patent is attached as **Exhibit C**. Claimant is the assignee of all

rights, title, and interest in and to the '394 Patent and possesses the exclusive right of recovery, including the exclusive right to recover for past infringement.

- f. The Asserted Patents are currently subject to the following proceedings at the United States Patent Office: IPR2018-00859; IPR2018-00875; IPR2018-00874, IPR2018-00873, IPR2018-00872, IPR2018-00871, IPR2018-00870 (collectively “**IPRs**”).
- g. Claimant commenced a lawsuit against Wal-Mart Stores, Inc., among others, Case No. 2-17-cv-00235 in the United States District Court for the Eastern District of Texas, Marshall Division, in which the District Court entered a claim construction order regarding the Asserted Patents, and Walmart, Intex, and Bestway admitted that many of the accused products infringed.
- h. Claimant manufactures and sells air bed products that practice the Asserted Patents throughout the United States, including selling such products to the Debtors or on www.sears.com for resale to consumers. In compliance with 35 U.S.C. § 287, Claimant marks and requires the marking of its products covered by the Asserted Patents with the appropriate and corresponding patent numbers.
- i. The Debtors import, have imported, sell, have sold, have offered for sale and/or offered for sale in the United States, airbed products that are not manufactured or licensed by Claimant that infringe the Asserted Patents (“**Infringing Products**”).
- j. The Asserted Patents are infringed and have been infringed in the statutory damages period by air beds that feature an internally housed pump. Examples of products that infringe the Asserted Patents include, but are not limited to, Intex®

brand air mattresses (including those with pump model number AP619A), Aerobed®, and Bestway®, among others.

- k. The Debtors imported, import, sell, offer for sale, have sold and/or have offered for sale Infringing Products within the United States.
 - l. The Debtors voluntarily and purposely placed the Infringing Products into the stream of commerce with the expectation that they would be offered for sale and sold in the United States.
 - m. On October 15, 2018, the Debtors filed voluntary chapter 11 petitions in this Court.
3. Amount of Claim.
- a. As of the date of this Proof of Claim, Claimant is owed an unliquidated unsecured prepetition claim in the aggregate amount of not less than \$21 million US dollars.
 - b. Claimant reserves its right to amend this Proof of Claim to assert additional claims it may hold, and to assert a different classification or amount of the Proof of Claim.
4. Classification of Claim.

The Proof of Claim is asserted as an unsecured claim. Claimant intends to file separately a request for administrative claims against the Debtors for their continued infringement of the Asserted Patents post-petition.

5. Credits and Setoffs.

No payments have been made with respect to amounts asserted in this Proof of Claim.

6. Supporting Documents.

The documents supporting this Proof of Claim are annexed and referenced above.

7. Reservation of Rights.

Claimant reserves the right to amend or supplement this Proof of Claim to reflect any additional claims against the Debtors and/or their debtor affiliates, to specify interest, costs, expenses, or other charges or claims incurred by Claimant and to file additional claims which may be based on the same or additional documents.

8. No Waiver.

This Proof of Claim is filed to protect Claimant from forfeiture of the Proof of Claim. The filing of this Proof of Claim is not: (a) a waiver or release of Claimant's rights against any person, entity, or property including but not limited to the Debtors, any of their debtor or non-debtor affiliates, successor or assigns including but not limited to Transform Holdco LLC; (b) a consent by Claimant to the jurisdiction of the United States Bankruptcy Court for the Southern District of New York with respect to the subject matter of the Proof of Claim or any objection or other proceeding commenced in these cases against or otherwise involving Claimant; (c) a waiver of the right to move to withdraw the reference or otherwise to challenge the jurisdiction of the United States Bankruptcy Court for the Southern District of New York; (d) an election of remedy; (e) a waiver of any rights or claims Claimant has against the Debtors or any person or entity with respect to any pending or future litigation or to any matters related to such litigation; or (f) a waiver of past, present, or future defaults or events of default.

9. Notices.

All notices to Claimant should be sent to:

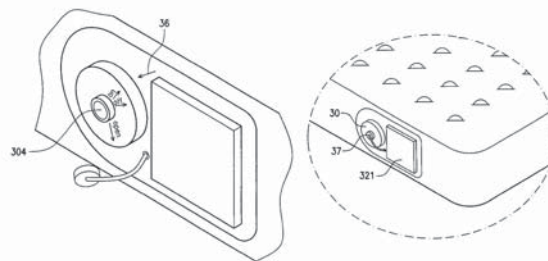
Diamond McCarthy LLP
295 Madison Avenue, 27th Floor
New York, New York 10017
Attn: Allan B. Diamond



US009211018B2

Exhibit A

(12) United States Patent Wang		(10) Patent No.: US 9,211,018 B2
		(45) Date of Patent: *Dec. 15, 2015
(54) INFLATABLE AIRBED PROVIDED WITH ELECTRIC PUMP HAVING PUMP BODY RECESSED INTO THE INFLATABLE AIRBED		(58) Field of Classification Search USPC 5/644, 706, 707, 713, 655.3, 413 AM See application file for complete search history.
(75) Inventor: Cheng Chung Wang, Taipei (TW)		(56) References Cited
(73) Assignee: Team Worldwide Corporation, Taipei (TW)		U.S. PATENT DOCUMENTS
(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 865 days. This patent is subject to a terminal disclaimer.		3,068,494 A * 12/1962 Plakwater 5/708 3,112,502 A * 12/1963 Forsberg 5/708 3,854,474 A * 12/1974 Carnuth 601/49 4,702,235 A * 10/1987 Hong 602/13 4,862,533 A * 9/1989 Adams, III 5/413 R 4,890,344 A * 1/1990 Walker 5/713 5,068,933 A * 12/1991 Seston 5/644 5,240,319 A * 10/1993 Higgs 5/713 5,267,363 A * 12/1993 Chaffee 5/710 5,367,726 A 11/1994 Chaffee 5,503,618 A 4/1996 Rey 5,542,136 A * 8/1996 Tapped 5/713 5,606,756 A 3/1997 Price 5,771,514 A 6/1998 Wilhoit 5,794,289 A 8/1998 Wortman et al. 5,827,052 A * 10/1998 Wang 417/478 5,848,875 A 12/1998 Saa-Jou (Continued)
(21) Appl. No.: 11/032,550		FOREIGN PATENT DOCUMENTS
(22) Filed: Jan. 10, 2005		DE 297 21 150 * 3/1998 Primary Examiner — Michael Safavi
(65) Prior Publication Data US 2005/0118046 A1 Jun. 2, 2005		(57) ABSTRACT An inflatable product includes an inflatable body and an electric pump for pumping the inflatable body. The electric pump includes a pump body and an air outlet, wherein the pump body is wholly or partially recessed into the inflatable body and permanently held by the inflatable body. Preferably, the electric pump includes a fan and a motor connected to the fan, and the fan is rotated by the motor in a first direction to pump the inflatable body or in a second direction opposite the first direction to deflate the inflatable body.
Related U.S. Application Data		14 Claims, 25 Drawing Sheets
(60) Continuation of application No. 10/459,690, filed on Jun. 11, 2008, now abandoned, which is a division of application No. 09/738,331, filed on Dec. 18, 2000, now Pat. No. 6,793,469, which is a continuation-in-part of application No. 09/542,477, filed on Apr. 4, 2000, now Pat. No. 6,332,760.		
(51) Int. Cl. A47C 27/08 (2006.01) F04D 25/08 (2006.01) F04D 29/60 (2006.01)		
(52) U.S. Cl. CPC A47C 27/082 (2013.01); F04D 25/084 (2013.01); F04D 29/601 (2013.01)		



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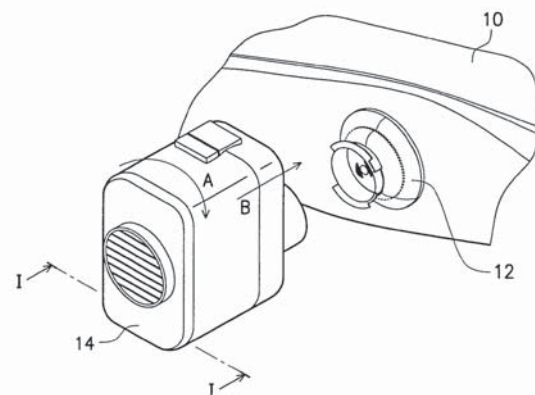


FIG. 1A (PRIOR ART)

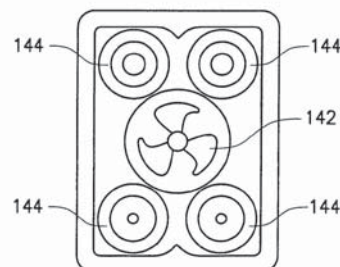


FIG. 1B (PRIOR ART)

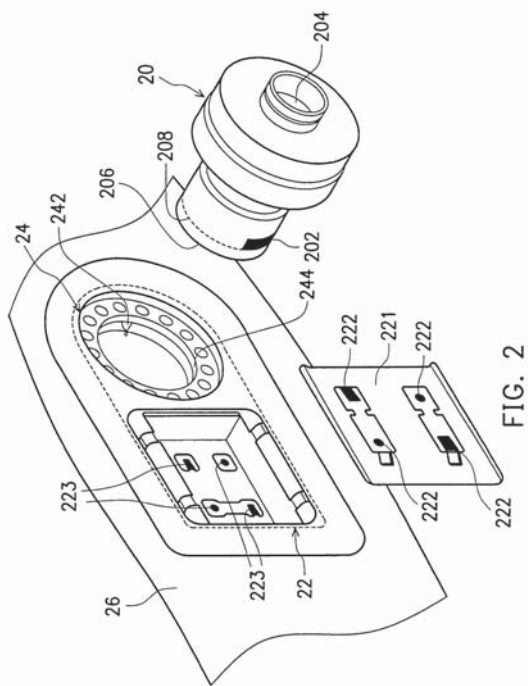


FIG. 2

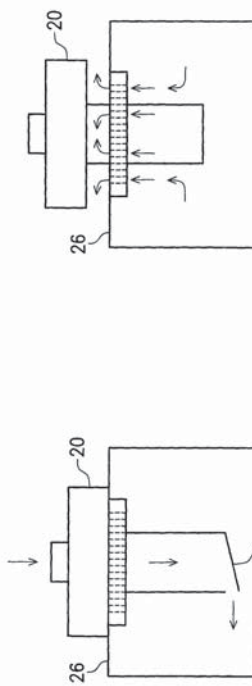


FIG. 3B

FIG. 3A

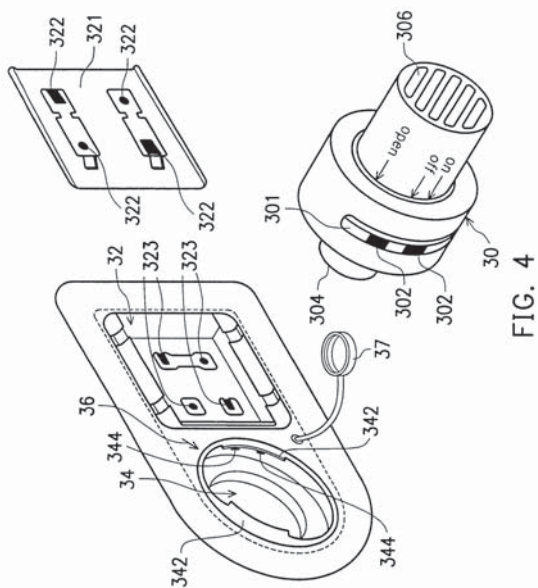


FIG. 4

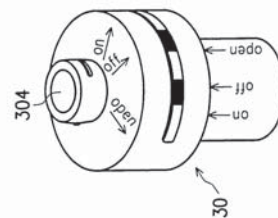
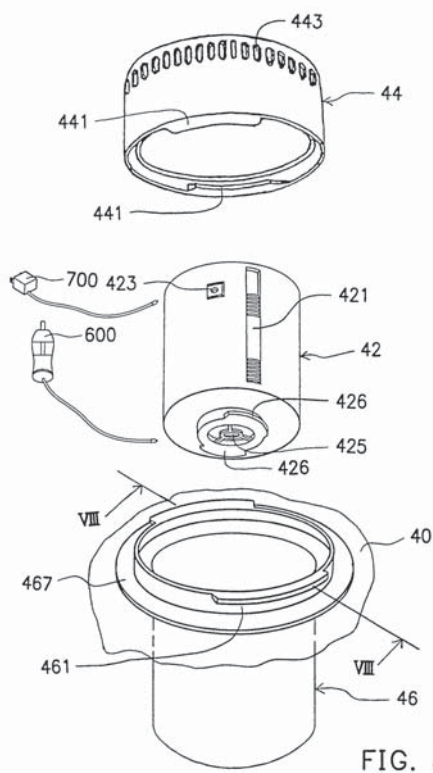
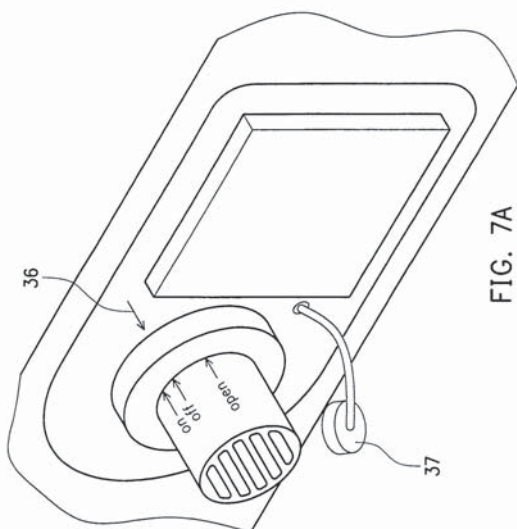
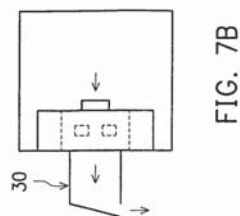
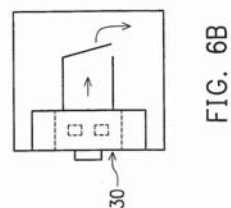
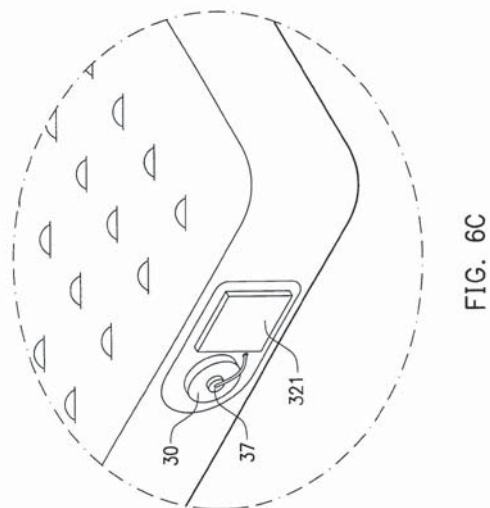
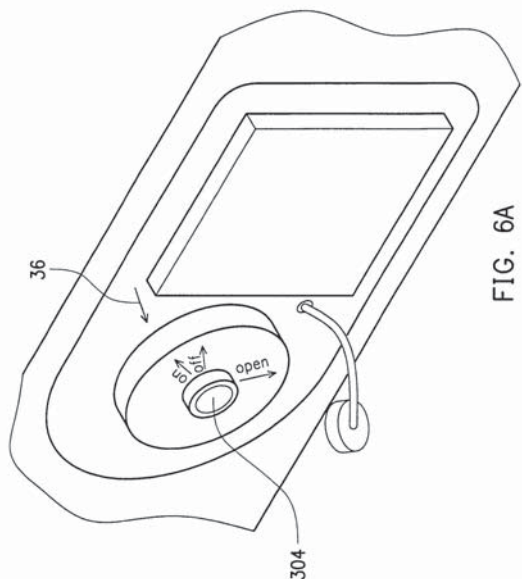


FIG. 5



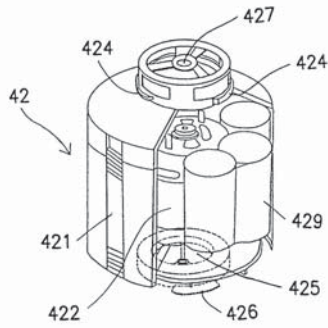


FIG. 8B

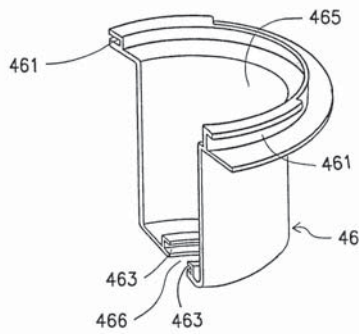


FIG. 8C

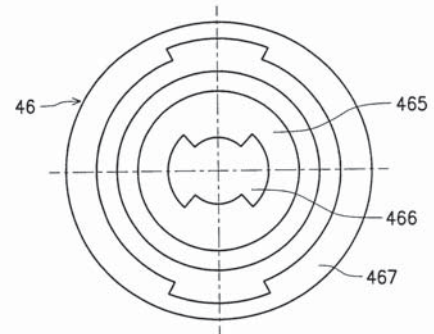


FIG. 8D

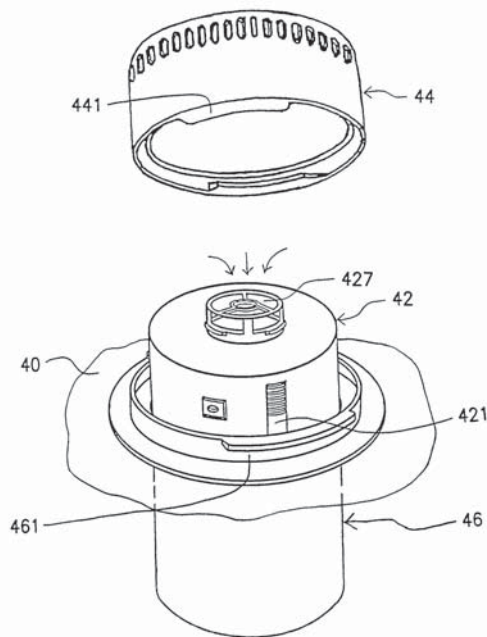


FIG. 8E

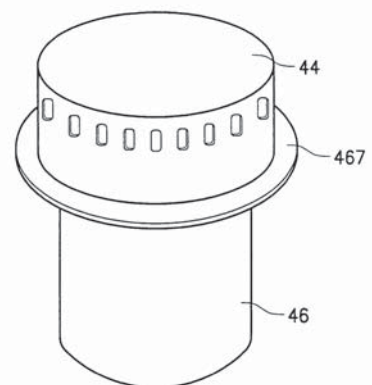


FIG. 8F

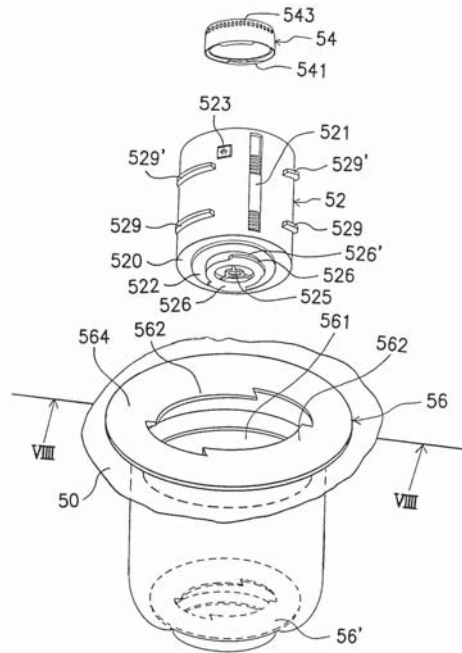


FIG. 9A

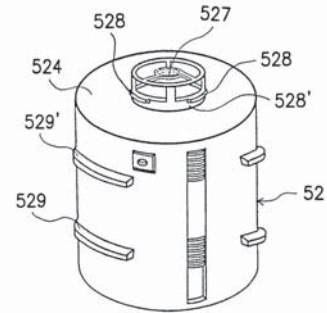


FIG. 9B

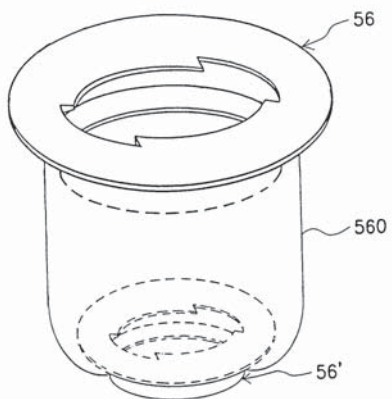


FIG. 9C

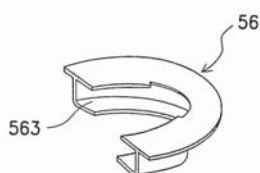


FIG. 9D

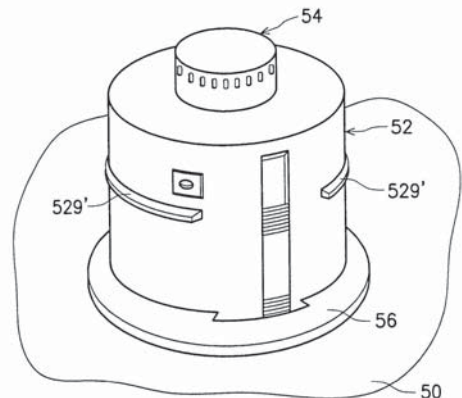


FIG. 9E

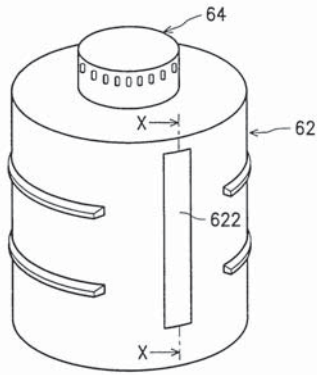


FIG. 10A

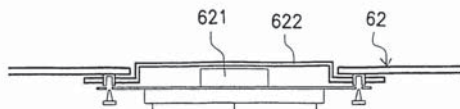


FIG. 10B

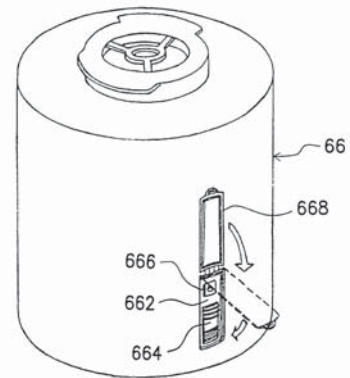


FIG. 11

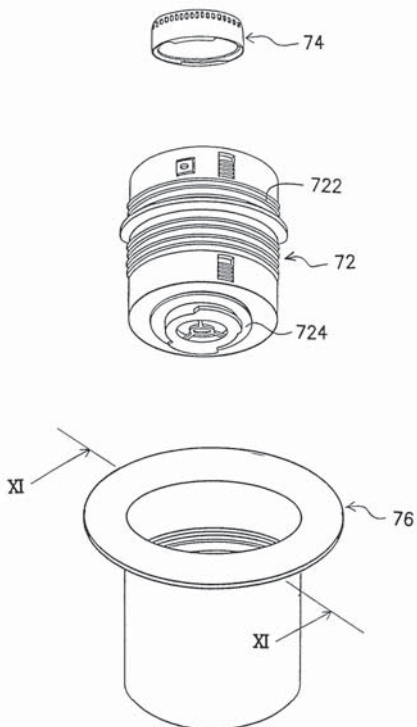


FIG. 12A

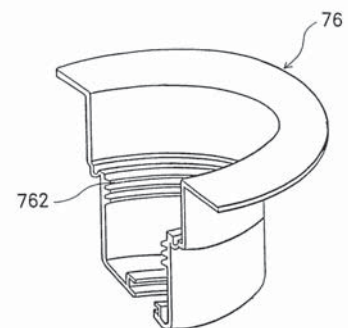


FIG. 12B

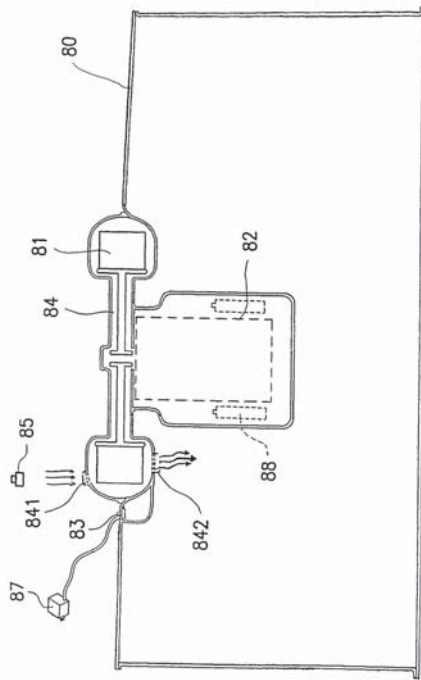


FIG. 13A

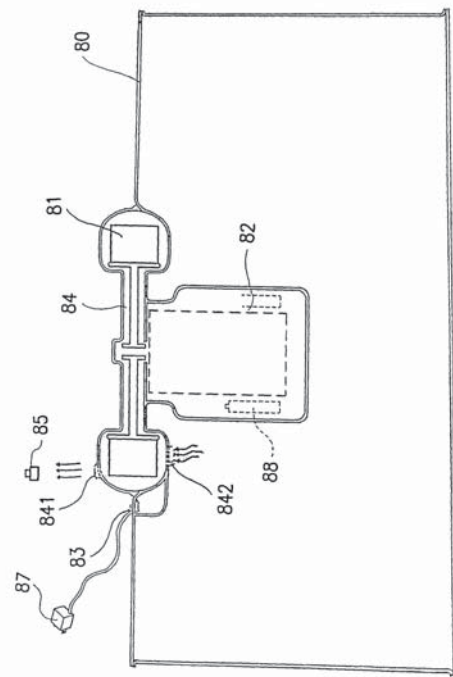


FIG. 13B

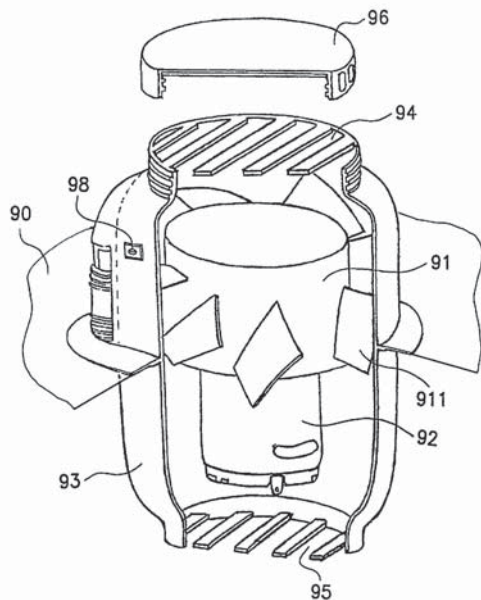


FIG. 14

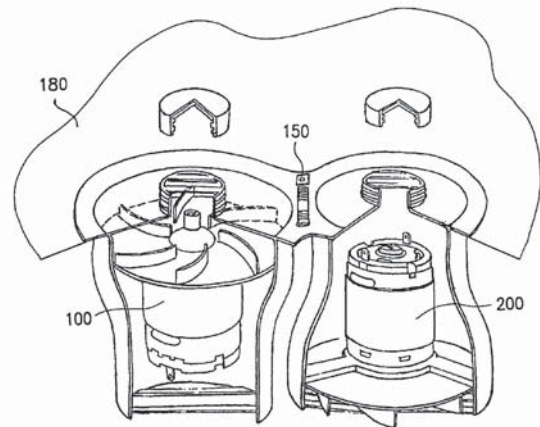


FIG. 15

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1 INFLATABLE AIRBED PROVIDED WITH ELECTRIC PUMP HAVING PUMP BODY RECESSED INTO THE INFLATABLE AIRBED

CROSS REFERENCE TO RELATED APPLICATIONS

This is a continuation of U.S. patent application Ser. No. 10,459,690, filed on Jun. 11, 2003, which is divisional application U.S. patent application Ser. No. 09/738,331, filed on Dec. 18, 2000, now U.S. Pat. No. 6,793,469, which is a continuation-in-part application of U.S. patent application Ser. No. 09/542,477, filed Apr. 4, 2000, now U.S. Pat. No. 6,332,760.

BACKGROUND

1. Field of the Invention
The present invention relates in general to an inflatable product provided with an electric pump.
2. Description of the Related Art
Referring to FIGS. 1A and 1B, a conventional electric pump 14 for inflating an airbed has a fan and motor 142 inside. A plurality of batteries 144 are loaded into the electric pump 14 to supply the power. The airbed 10 is provided with a valve 12. In operation, the electric pump 14 is connected to the valve 12 in direction B and then rotated in direction A to fasten the connection between the electric pump 14 and the airbed 10. Then, the airbed 10 is pumped by the electric pump 14.

SUMMARY

In an embodiment of the present invention, an inflatable product comprising an inflatable body and an electric pump for pumping the inflatable body is provided. The electric pump comprises a pump body and an air outlet, wherein the pump body is wholly or partially recessed into the inflatable body and permanently held by the inflatable body. The electric pump preferably comprises a fan and a motor connected to the fan, and the fan is rotated by the motor in a first direction to pump the inflatable body or in a second direction opposite the first direction to deflate the inflatable body. In one preferred embodiment, the pump body is located in the inflatable body. Preferably, the air outlet is also located in the inflatable body.

In another embodiment of the invention, an inflatable product comprising an inflatable body and an electric pump for pumping the inflatable body is provided. The electric pump comprises a pump body and an air outlet, wherein the pump body is wholly or partially recessed into the inflatable body.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention can be more fully understood by reading the subsequent detailed description and examples with references made to the accompanying drawings, wherein:

FIG. 1A depicts a conventional airbed;
FIG. 1B is a sectional view along line I-I in FIG. 1A;
FIG. 2 locally depicts an airbed in accordance with a first embodiment of the present invention;
FIG. 3A shows the inflating operation of the airbed of the first embodiment;
FIG. 3B shows the deflating operation of the airbed of the first embodiment;

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grooves 461 of the socket 46. Thus, the cover 44 and the socket 46 are firmly connected together. The cover 44 protects the electric pump 30 from water.

In the deflating operation, the electric pump 30 is fitted in reverse into the socket 46, with the air inlet 427 of the electric pump 30 aligning with the bottom hole 466 of the socket 46. Then, the electric pump 30 pumps air inside the airbed out.

Referring to FIG. 4A, an airbed of the fourth embodiment of the present invention is provided with a cover 54, an electric pump 52 and a set of sockets 56, 56' built in the body of the airbed. The cover 54 is circular, with a plurality of recesses 543 provided on its side surfaces. Such an arrangement increases the friction on the side surfaces, facilitates the user to rotate the cover 54. Furthermore, the cover 54 is closed at its top end and is opened at its bottom end. At the bottom end of the cover 54 is provided a pair of inward arcuate flanges 541. The arcuate flanges 541 extend to the rim of the bottom end of the cover 54 for engaging the socket 56. The electric pump 52 is cylindrical. On the side surfaces of the electric pump 52 are provided a switch 521, a connector 523 and circumferential flanges 529, 529'. Furthermore, a plurality of rechargeable batteries (not shown) are provided in the electric pump 52 to supply the power. The connector 523 is used for connecting an external power to charge the batteries or directly to actuate the electric pump 52. Referring to both FIGS. 9A and 9B, at the ends 524, 520 of the electric pump 52 are provided a protruding air inlet 527 and a protruding air outlet 525. A pair of outward flanges 528 are provided at the air inlet 527, with grooves 528' formed between the flanges 528 and the end 524. Another pair of outward flanges 526 are provided at the air outlet 525 to form grooves 526' between the flanges 526 and the end 520. Referring to FIG. 9C, the set of sockets include a top socket 56 and a bottom socket 56' connected by a flexible sleeve 560. The top socket 56 is welded together with the body 50 of the airbed. The top and bottom sockets 56, 56' have the same structure and therefore only the top socket 56 is shown in FIG. 9C. The top socket 56 has a top surface 564 with a through hole 561 provided on the top surface 564. Furthermore, the top socket 56 has a pair of inward flanges 562 protruding from the top surface 564 toward the through hole 561. Referring to FIG. 9D, an annular groove 563 is formed in the socket 56.

In the inflating operation, the electric pump 52 is inserted into the set of sockets 56, 56' on the airbed 50. The protruding air outlet 525 of the electric pump 52 is fitted into the bottom socket 56'. The rubber pad 522 eliminates any gaps between the bottom sockets 56' and the electric pump 52 through which the airbed possibly leaks. The circumferential flanges 529 of the electric pump 52 enter the grooves 563 of the socket 56. Then, the electric pump 52 is rotated so that the flanges 529 of the electric pump 52 are confined in the grooves 563 by the flanges 562 of the top socket 56. Then, the user pushes the switch 521 on the electric pump 52 to pump the airbed. After the airbed is filled with air, the user assembles the cover 54 and the electric pump 52 as shown in FIG. 9E, with the flanges 541 of the cover 54 received in the grooves 528' of the electric pump 52. The cover 54 prevents the airbed from leaking through the air inlet 527.

In the deflating operation, the electric pump 52 is reversely disposed with the air inlet 527 connected to the bottom socket 56'. Also, the flanges 528' of the electric pump 52 are confined in the grooves 563 by the flanges 562 of the top socket 56. Then, the user pushes the switch 521 on the electric pump 52 to pump air in the airbed out. It is noted that the electric pump 52 is not protected from water. Nevertheless, the electric pump 52 can be modified to be waterproof, introduced in the following fifth embodiment.

FIG. 4 locally depicts an airbed in accordance with a second embodiment of the present invention;
FIG. 5 is a perspective diagram of the electric pump of the second embodiment;

FIGS. 6A, 6B and 6C show the inflating operation of the airbed of the second embodiment;

FIGS. 7A and 7B show the deflating operation of the airbed of the second embodiment;

FIG. 8A is an exploded perspective diagram of a local portion of an airbed in accordance with a third embodiment of the present invention;

FIG. 8B is a perspective diagram of the electric pump of the airbed of the third embodiment;

FIG. 8C is a sectional view of a socket of the airbed along line VIII-VIII in FIG. 8A;

FIG. 8D is a top view of the socket shown in FIG. 8A;

FIG. 8E depicts the electric pump and the socket assembled together in accordance with the third embodiment of the present invention;

FIG. 8F depicts the cover, the electric pump and the socket assembled together in accordance with the third embodiment of the present invention;

FIG. 9A is an exploded perspective diagram of a local portion of an airbed in accordance with a fourth embodiment of the present invention;

FIG. 9B is a perspective diagram of the electric pump of the airbed of the fourth embodiment;

FIG. 9C depicts a set of sockets of the fourth embodiment;

FIG. 9D is a sectional view of a socket of the airbed along line VIII-VIII in FIG. 9A;

FIG. 9E depicts the cover, the electric pump and the socket assembled together in accordance with the fourth embodiment of the present invention;

FIG. 10A is a perspective diagram of a local portion of an airbed in accordance with a fifth embodiment of the present invention;

FIG. 10B is a sectional view of the electric pump along line X-X in FIG. 10A;

FIG. 11 is a perspective diagram of an electric pump of an airbed in accordance with a sixth embodiment of the present invention;

FIG. 12A is a perspective diagram of a cover, electric pump and socket of an airbed in accordance with a seventh embodiment of the present invention;

FIG. 12B is a sectional view of the socket along line XI-XI of FIG. 12A;

FIG. 13A is a schematic diagram of an airbed in an inflating operation in accordance with an eighth embodiment of the present invention;

FIG. 13B is a schematic diagram of the airbed in a deflating operation in accordance with the eighth embodiment of the present invention;

FIG. 14 is a perspective diagram of an electric pump of an airbed in accordance with a ninth embodiment of the present invention;

FIG. 15 is a perspective diagram of an electric pump of an airbed in accordance with a tenth embodiment of the present invention.

DESCRIPTION

Referring to FIG. 2, an airbed 26 of a first embodiment of the present invention is provided with a detachable electric pump 20, a built-in battery case 22 and a built-in socket 24. The battery case 22 has two chambers 222 in which electrodes 222 are provided. Also, on the bottom of the battery case 22 are provided electrodes 223 corresponding to the electrodes 222

of the cover 221. An O-ring 244 and an electrode 242 are provided on the inner wall of the socket 24, wherein the electrode 242 is electrically connected to the electrodes 222, 223 of the battery case 22. Furthermore, the electric pump 20 is substantially cylindrical and has an electrode 202 on its side surfaces, an air inlet 204 and an air outlet 206 on its ends and a check valve 208 inside. The check valve 208 of the electric pump allows air to flow in a single direction from the inlet 204 to the outlet 206.

In operation, batteries are loaded into the battery case 22. The electric pump 20 is fitted into the socket 24 and then rotated so that the electrode 202 of the electric pump 20 physically contacts the electrode 242 of the socket 24. Then, the electric pump 20 is actuated to pump air inside the airbed 26 as shown in FIG. 3A. The O-ring 242 in the socket 24 prevents the airbed 26 from leaking. In deflating operation, the user detaches the electric pump 20 from the socket 24 to deflate the airbed 26, as shown in FIG. 3B.

It is understood that the O-ring can be provided on the side surfaces of the electric pump 20 instead of in the socket 24 to prevent the airbed from leaking.

Referring to FIG. 4, an airbed of a second embodiment of the present invention is provided with a detachable electric pump 30, a cap 37 for the electric pump 30, a built-in battery case 32 and a built-in socket 34. The battery case 32 has a cover 321 on which electrodes 322 are provided. Also, on the bottom of the battery case 32 are provided electrodes 323 corresponding to the electrodes 322 of the cover 321. Furthermore, an arrow symbol 36 is marked on the airbed and besides the socket 34. Flanges 342 are formed at the rim of the socket 34, while electrodes 344 are provided on the inner wall of the socket 34 and are electrically connected to the electrodes 322, 323 of the battery case 32. Furthermore, the electric pump 30 is substantially cylindrical and has a flange 301 on its side surfaces, two electrodes 302 provided on the flange 301, an air inlet 304 and an air outlet 306 on its ends. Also referring to FIG. 5, symbols "on", "off" and "open" are marked on the side surfaces and the end of the electric pump 30.

In operation, batteries are loaded into the battery case 32 to supply the electric pump 30 with the power. The electric pump 30 in this embodiment is used to inflate or deflate the airbed. In inflating operation, the electric pump 30 is fitted into the socket 34 with the air outlet 306 inside the airbed and the air inlet 304 outside the airbed. The electric pump 30 is rotated to change the positions of symbols "on", "off" and "open". When the arrow symbol 36 points at the symbol "on" as shown in FIG. 6A, the electrodes 302 of the electric pump 30 physically contact the electrodes 344 of the socket 34 to actuate the electric pump 30. Then, outside air is pumped into the airbed as shown in FIG. 6B. When the arrow symbol 36 points at the symbol "off", the electric pump 30 is stopped.

When the arrow symbol 36 points at the symbol "open", the electric pump 30 is detachable from the socket 34. FIG. 6C depicts the airbed full of air, wherein the air outlet of the electric pump 30 is closed by the cap 37 to seal the airbed after the inflating operation.

In the deflating operation, the electric pump 30 is fitted in reverse into the socket 34, with the air inlet 304 inside the airbed and the air outlet 306 outside the airbed. The electric pump 30 is rotated to change the positions of symbols "on", "off" and "open" on its side surfaces. When the arrow symbol 36 points at the symbol "on" as shown in FIG. 7A, the electrodes 302 of the electric pump 30 physically contact the electrodes 344 of the socket 34 to actuate the electric pump 30. Then, air inside the airbed is pumped out as shown in FIG. 7B. When the arrow symbol 36 points at the symbol "off", the

operation, the cover 96 is taken away. The fan 91 is rotated by the motor 92 in reverse to pump air inside the airbed out.

Referring to FIG. 15, in a tenth embodiment of the present invention, a first fan and motor 100 and a second fan and motor 200 are housed in different chambers. The first and second fans and motors 100, 200 are permanently or detachably connected to the airbed 180 (not fully shown in FIG. 15). Furthermore, the motors 100 and 200 are actuated by rechargeable batteries (not shown) or by an external power (not shown) via a connector 150. In the inflating operation, the first fan and motor 100 is actuated to pump the airbed 180 (not fully shown in FIG. 15) while the second fan and motor 200 is at rest. In the deflating operation, the first fan and motor 100 is at rest while the second fan and motor 200 is actuated to pump air inside the airbed out.

In conclusion, the invention provides various ways to pump an airbed or other inflatable products.

While the invention has been described by way of example and in terms of the preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, it is intended to cover various modifications and similar arrangements as would be apparent to those skilled in the art. Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.

What is claimed is:

1. An inflatable product comprising:
an inflatable body comprising an exterior wall; and
an electric pump for pumping the inflatable body, the electric pump comprising a pump body and an air outlet, wherein the pump body is built into the exterior wall and wholly or partially recessed into the inflatable body, leaving at least a portion of the pump body exposed by the exterior wall, and wherein the pump body is permanently held by the inflatable body.

2. The inflatable product as claimed in claim 1, wherein the electric pump comprises a fan and a motor connected to the fan, and the fan is rotated by the motor in a first direction to pump the inflatable body or in a second direction opposite the first direction to deflate the inflatable body.

3. The inflatable product as claimed in claim 1, further comprising a battery to supply the electric pump with power.

4. The inflatable product as claimed in claim 3, wherein the battery is a rechargeable battery.

5. The inflatable product as claimed in claim 1, further comprising a rectifier via which the electric pump is electrically connected to an electric power.

6. The inflatable product as claimed in claim 1, further comprising a cigarette plug via which the electric pump is electrically connected to an electric power.

7. The inflatable product as claimed in claim 1, further comprising a connector via which the electric pump is electrically connected to an electric power.

8. The inflatable product as claimed in claim 1, further comprising a battery and a connector via which the electric pump is electrically connected to an electric power, so that the electric pump is selectively actuated by the battery or the electric power.

9. The inflatable product as claimed in claim 8, wherein the battery is a rechargeable battery.

10. The inflatable product as claimed in claim 1, wherein the electric pump uses an alternating current.

11. The inflatable product as claimed in claim 12, wherein the pump body is located in the inflatable body.

12. The inflatable product as claimed in claim 12, wherein the air outlet is located in the inflatable body.

13. An inflatable product comprising:
an inflatable body comprising an exterior wall; and
an electric pump for pumping the inflatable body, the electric pump comprising a pump body and an air outlet, wherein the pump body is built into the exterior wall and wholly or partially recessed into the inflatable body, leaving at least a portion of the pump body exposed by the exterior wall.

14. The inflatable product as claimed in claim 13, wherein the electric pump comprises a fan and a motor connected to the fan, and the fan is rotated by the motor in a first direction to pump the inflatable body or in a second direction opposite the first direction to deflate the inflatable body.

15. The inflatable product as claimed in claim 13, further comprising a battery to supply the electric pump with power.

16. The inflatable product as claimed in claim 13, wherein the battery is a rechargeable battery.

17. The inflatable product as claimed in claim 13, further comprising a rectifier via which the electric pump is electrically connected to an electric power.

18. The inflatable product as claimed in claim 13, further comprising a cigarette plug via which the electric pump is electrically connected to an electric power.

19. The inflatable product as claimed in claim 13, further comprising a connector via which the electric pump is electrically connected to an electric power.

20. The inflatable product as claimed in claim 13, further comprising a battery and a connector via which the electric pump is electrically connected to an electric power, so that the electric pump is selectively actuated by the battery or the electric power.

21. The inflatable product as claimed in claim 13, wherein the battery is a rechargeable battery.

22. The inflatable product as claimed in claim 13, wherein the electric pump uses an alternating current.

23. The inflatable product as claimed in claim 13, wherein the pump body is located in the inflatable body.

24. The inflatable product as claimed in claim 13, wherein the air outlet is located in the inflatable body.

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FIG. 4 locally depicts an airbed in accordance with a second embodiment of the present invention;
FIG. 5 is a perspective diagram of the electric pump of the second embodiment;

FIGS. 6A, 6B and 6C show the inflating operation of the airbed of the second embodiment;

FIGS. 7A and 7B show the deflating operation of the airbed of the second embodiment;

FIG. 8A is an exploded perspective diagram of a local portion of an airbed in accordance with a third embodiment of the present invention;

FIG. 8B is a perspective diagram of the electric pump of the airbed of the third embodiment;

FIG. 8C is a sectional view of a socket of the airbed along line VIII-VIII in FIG. 8A;

FIG. 8D is a top view of the socket shown in FIG. 8A;

FIG. 8E depicts the electric pump and the socket assembled together in accordance with the third embodiment of the present invention;

FIG. 8F depicts the cover, the electric pump and the socket assembled together in accordance with the third embodiment of the present invention;

FIG. 9A is an exploded perspective diagram of a local portion of an airbed in accordance with a fourth embodiment of the present invention;

FIG. 9B is a perspective diagram of the electric pump of the airbed of the fourth embodiment;

FIG. 9C depicts a set of sockets of the fourth embodiment;

FIG. 9D is a sectional view of a socket of the airbed along line VIII-VIII in FIG. 9A;

FIG. 9E depicts the cover, the electric pump and the socket assembled together in accordance with the fourth embodiment of the present invention;

FIG. 10A is a perspective diagram of a local portion of an airbed in accordance with a fifth embodiment of the present invention;

FIG. 10B is a sectional view of the electric pump along line X-X in FIG. 10A;

FIG. 11 is a perspective diagram of an electric pump of an airbed in accordance with a sixth embodiment of the present invention;

FIG. 12A is a perspective diagram of a cover, electric pump and socket of an airbed in accordance with a seventh embodiment of the present invention;

FIG. 12B is a sectional view of the socket along line XI-XI of FIG. 12A;

FIG. 13A is a schematic diagram of an airbed in an inflating operation in accordance with an eighth embodiment of the present invention;

FIG. 13B is a schematic diagram of the airbed in a deflating operation in accordance with the eighth embodiment of the present invention;

FIG. 14 is a perspective diagram of an electric pump of an airbed in accordance with a ninth embodiment of the present invention;

FIG. 15 is a perspective diagram of an electric pump of an airbed in accordance with a tenth embodiment of the present invention.

Referring to FIG. 2, an airbed 26 of a first embodiment of the present invention is provided with a detachable electric pump 20, a built-in battery case 22 and a built-in socket 24. The battery case 22 has two chambers 222 in which electrodes 222 are provided. Also, on the bottom of the battery case 22 are provided electrodes 223 corresponding to the electrodes 222

of the cover 221. An O-ring 244 and an electrode 242 are provided on the inner wall of the socket 24, wherein the electrode 242 is electrically connected to the electrodes 222, 223 of the battery case 22. Furthermore, the electric pump 20 is substantially cylindrical and has an electrode 202 on its side surfaces, an air inlet 204 and an air outlet 206 on its ends and a check valve 208 inside. The check valve 208 of the electric pump allows air to flow in a single direction from the inlet 204 to the outlet 206.

In operation, batteries are loaded into the battery case 22. The electric pump 20 is fitted into the socket 24 and then rotated so that the electrode 202 of the electric pump 20 physically contacts the electrode 242 of the socket 24. Then, the electric pump 20 is actuated to pump air inside the airbed 26 as shown in FIG. 3A. The O-ring 242 in the socket 24 prevents the airbed 26 from leaking. In deflating operation, the user detaches the electric pump 20 from the socket 24 to deflate the airbed 26, as shown in FIG. 3B.

It is understood that the O-ring can be provided on the side surfaces of the electric pump 20 instead of in the socket 24 to prevent the airbed from leaking.

Referring to FIG. 4, an airbed of a second embodiment of the present invention is provided with a detachable electric pump 30, a cap 37 for the electric pump 30, a built-in battery case 32 and a built-in socket 34. The battery case 32 has a cover 321 on which electrodes 322 are provided. Also, on the bottom of the battery case 32 are provided electrodes 323 corresponding to the electrodes 322 of the cover 321. Furthermore, an arrow symbol 36 is marked on the airbed and besides the socket 34. Flanges 342 are formed at the rim of the socket 34, while electrodes 344 are provided on the inner wall of the socket 34 and are electrically connected to the electrodes 322, 323 of the battery case 32. Furthermore, the electric pump 30 is substantially cylindrical and has a flange 301 on its side surfaces, two electrodes 302 provided on the flange 301, an air inlet 304 and an air outlet 306 on its ends. Also referring to FIG. 5, symbols "on", "off" and "open" are marked on the side surfaces and the end of the electric pump 30.

In operation, batteries are loaded into the battery case 32 to supply the electric pump 30 with the power. The electric pump 30 in this embodiment is used to inflate or deflate the airbed. In inflating operation, the electric pump 30 is fitted into the socket 34 with the air outlet 306 inside the airbed and the air inlet 304 outside the airbed. The electric pump 30 is rotated to change the positions of symbols "on", "off" and "open". When the arrow symbol 36 points at the symbol "on" as shown in FIG. 6A, the electrodes 302 of the electric pump 30 physically contact the electrodes 344 of the socket 34 to actuate the electric pump 30. Then, outside air is pumped into the airbed as shown in FIG. 6B. When the arrow symbol 36 points at the symbol "off", the electric pump 30 is stopped.

When the arrow symbol 36 points at the symbol "open", the electric pump 30 is detachable from the socket 34. FIG. 6C depicts the airbed full of air, wherein the air outlet of the electric pump 30 is closed by the cap 37 to seal the airbed after the inflating operation.

In the deflating operation, the electric pump 30 is fitted in reverse into the socket 34, with the air inlet 304 inside the airbed and the air outlet 306 outside the airbed. The electric pump 30 is rotated to change the positions of symbols "on", "off" and "open" on its side surfaces. When the arrow symbol 36 points at the symbol "on" as shown in FIG. 7A, the electrodes 302 of the electric pump 30 physically contact the electrodes 344 of the socket 34 to actuate the electric pump 30. Then, air inside the airbed is pumped out as shown in FIG. 7B. When the arrow symbol 36 points at the symbol "off", the

operation, the cover 96 is taken away. The fan 91 is rotated by the motor 92 in reverse to pump air inside the airbed out.

Referring to FIG. 15, in a tenth embodiment of the present invention, a first fan and motor 100 and a second fan and motor 200 are housed in different chambers. The first and second fans and motors 100, 200 are permanently or detachably connected to the airbed 180 (not fully shown in FIG. 15). Furthermore, the motors 100 and 200 are actuated by rechargeable batteries (not shown) or by an external power (not shown) via a connector 150. In the inflating operation, the first fan and motor 100 is actuated to pump the airbed 180 (not fully shown in FIG. 15) while the second fan and motor 200 is at rest. In the deflating operation, the first fan and motor 100 is at rest while the second fan and motor 200 is actuated to pump air inside the airbed out.

In conclusion, the invention provides various ways to pump an airbed or other inflatable products.

While the invention has been described by way of example and in terms of the preferred embodiment, it is to be understood that the invention is not limited to the disclosed embodiments. To the contrary, it is intended to cover various modifications and similar arrangements as would be apparent to those skilled in the art. Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.

What is claimed is:

1. An inflatable product comprising:
an inflatable body comprising an exterior wall; and
an electric pump for pumping the inflatable body, the electric pump comprising a pump body and an air outlet, wherein the pump body is built into the exterior wall and wholly or partially recessed into the inflatable body, leaving at least a portion of the pump body exposed by the exterior wall, and wherein the pump body is permanently held by the inflatable body.

2. The inflatable product as claimed in claim 1, wherein the electric pump comprises a fan and a motor connected to the fan, and the fan is rotated by the motor in a first direction to pump the inflatable body or in a second direction opposite the first direction to deflate the inflatable body.

3. The inflatable product as claimed in claim 1, further comprising a battery to supply the electric pump with power.

4. The inflatable product as claimed in claim 3, wherein the battery is a rechargeable battery.

5. The inflatable product as claimed in claim 1, further comprising a rectifier via which the electric pump is electrically connected to an electric power.

6. The inflatable product as claimed in claim 1, further comprising a cigarette plug via which the electric pump is electrically connected to an electric power.

7. The inflatable product as claimed in claim 1, further comprising a connector via which the electric pump is electrically connected to an electric power.

8. The inflatable product as claimed in claim 1, further comprising a battery and a connector via which the electric pump is electrically connected to an electric power, so that the electric pump is selectively actuated by the battery or the electric power.

9. The inflatable product as claimed in claim 8, wherein the battery is a rechargeable battery.

10. The inflatable product as claimed in claim 1, wherein the electric pump uses an alternating current.

11. The inflatable product as claimed in claim 12, wherein the pump body is located in the inflatable body.

12. The inflatable product as claimed in claim 12, wherein the air outlet is located in the inflatable body.

13. An inflatable product comprising:
an inflatable body comprising an exterior wall; and
an electric pump for pumping the inflatable body, the electric pump comprising a pump body and an air outlet, wherein the pump body is built into the exterior wall and wholly or partially recessed into the inflatable body

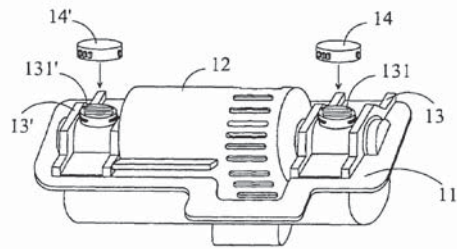


FIG. 1B

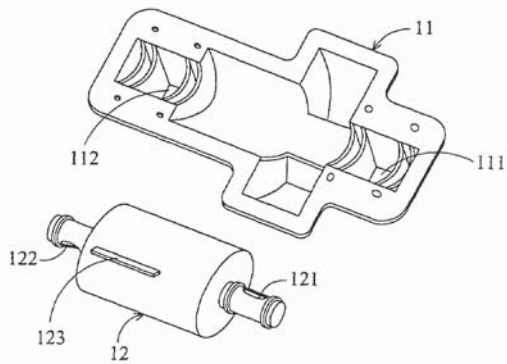


FIG. 1C

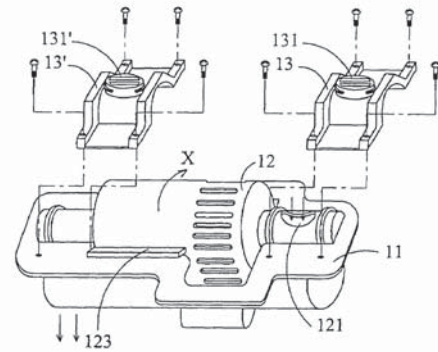


FIG. 1D

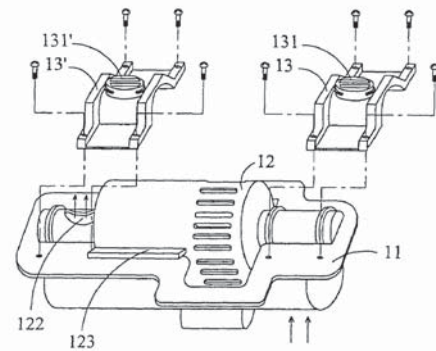


FIG. 1E

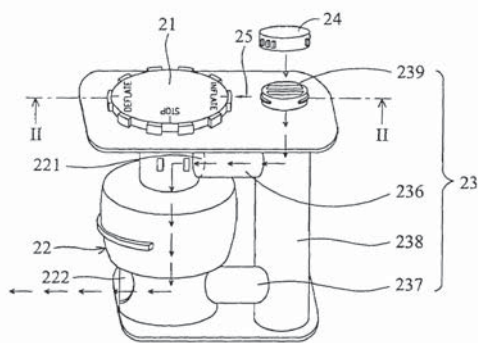


FIG. 2A

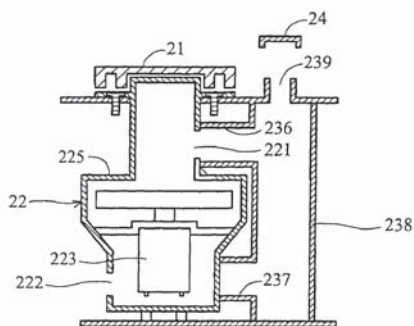


FIG. 2B

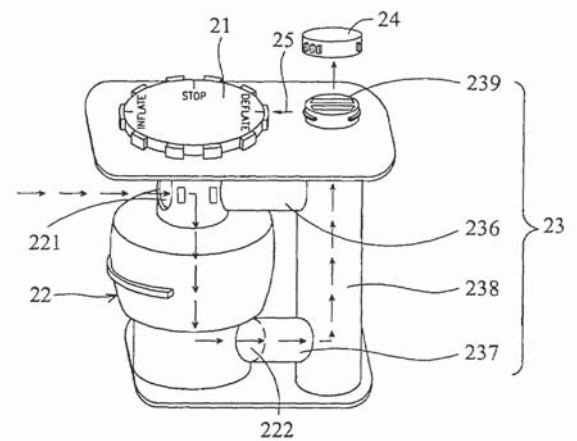


FIG. 2C

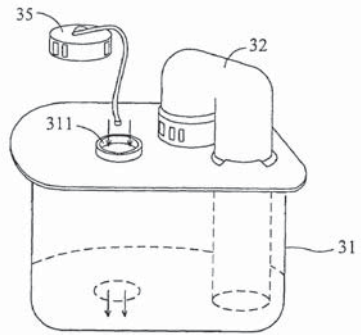


FIG. 3A

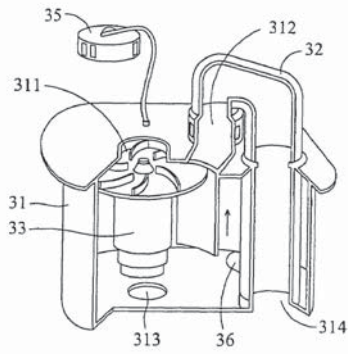


FIG. 3B

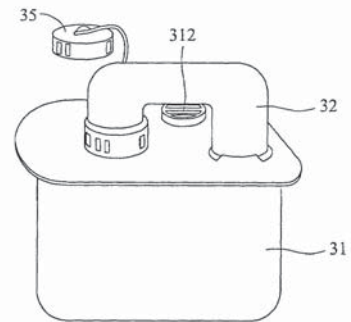


FIG. 3C

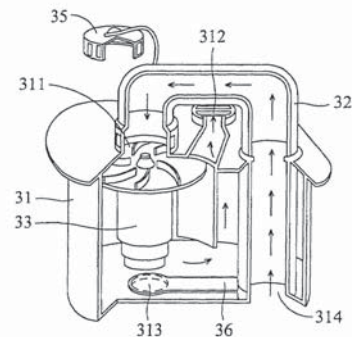


FIG. 3D

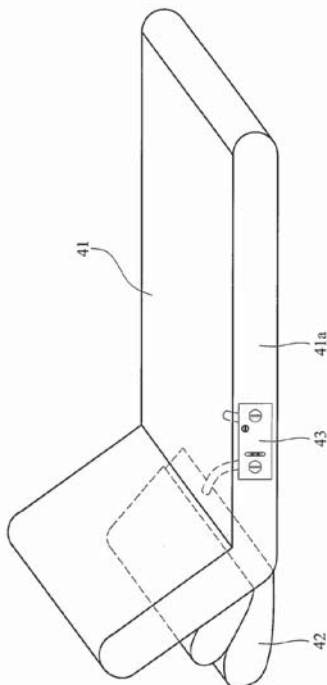


FIG. 4A

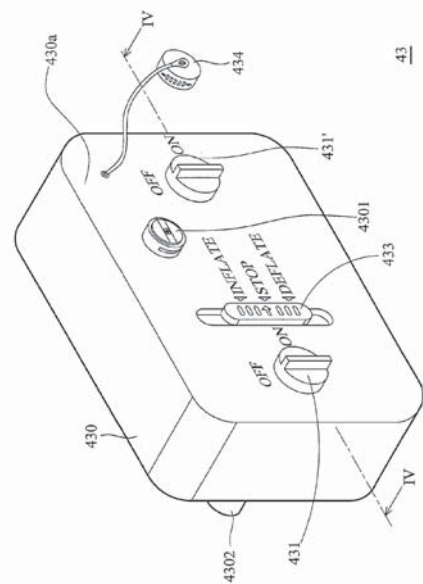


FIG. 4B

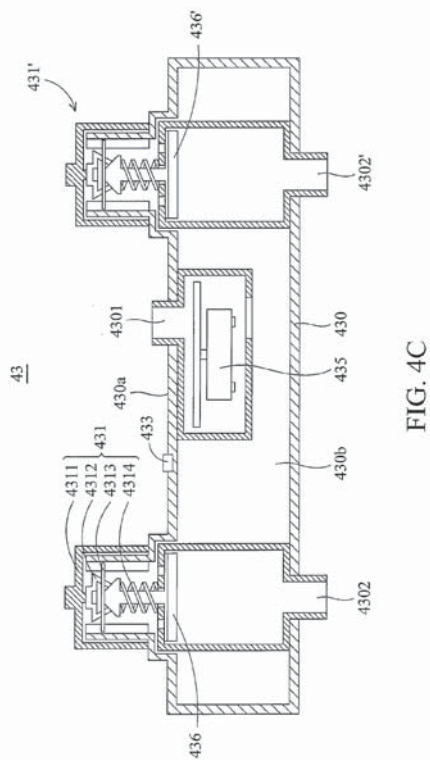


FIG. 4C

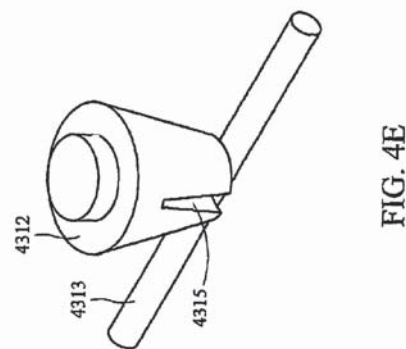


FIG. 4E

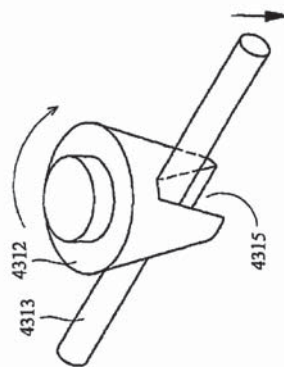


FIG. 4D

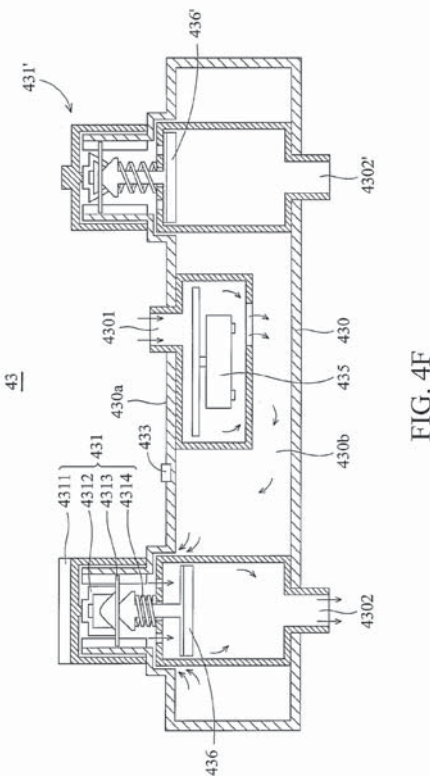


FIG. 4F

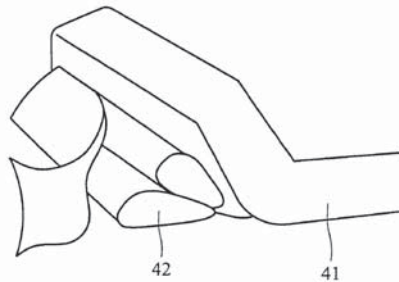


FIG. 4G

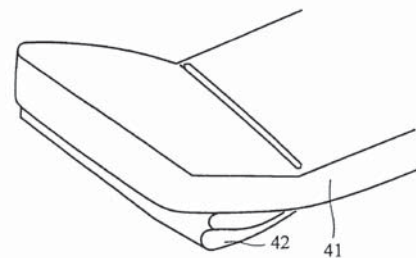


FIG. 4H

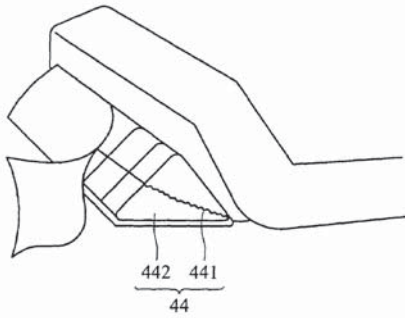


FIG. 4I

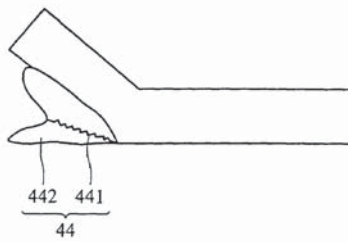


FIG. 4J

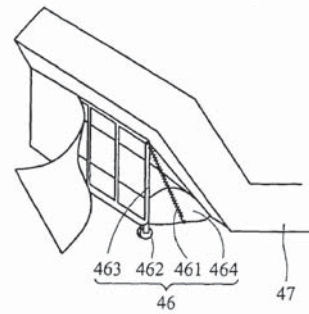


FIG. 4K

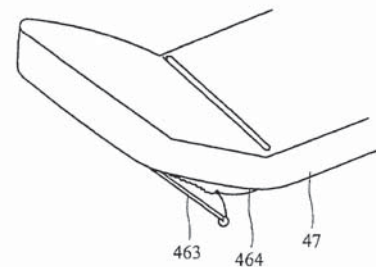


FIG. 4L

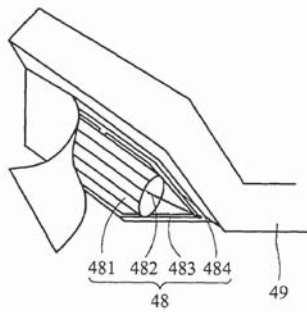


FIG. 4M

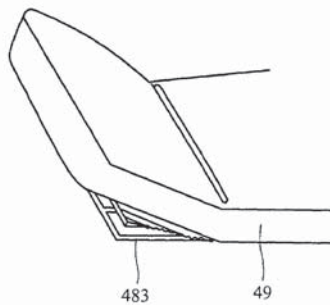


FIG. 4N

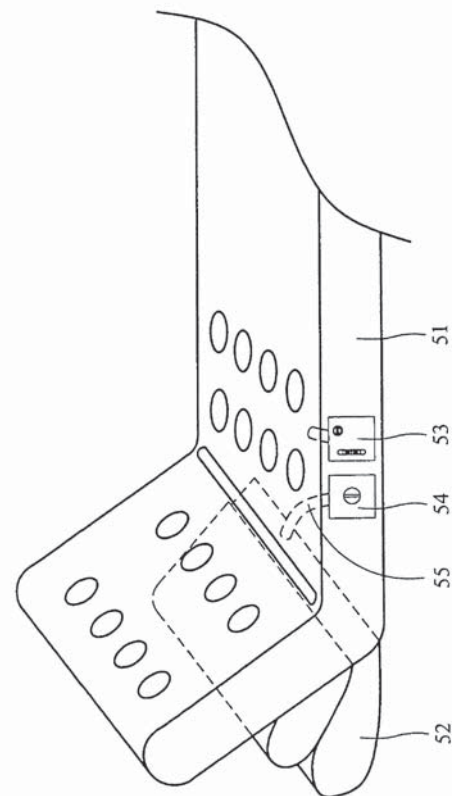


FIG. 5A

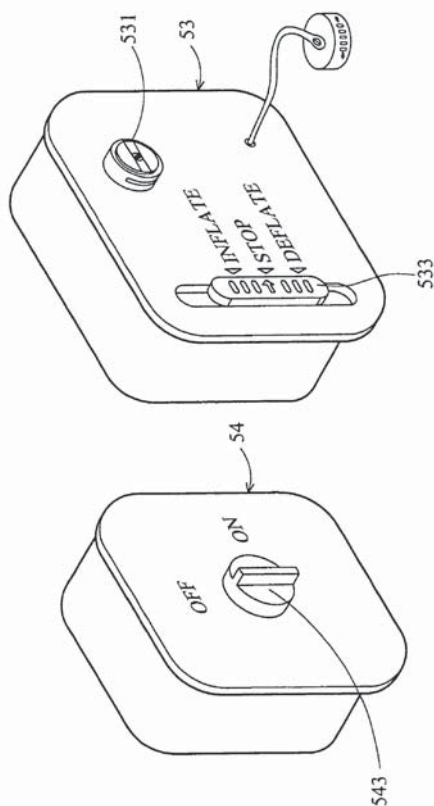


FIG. 5B

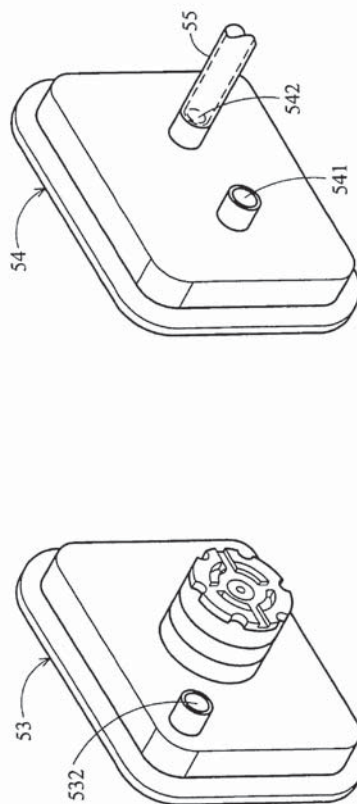


FIG. 5C

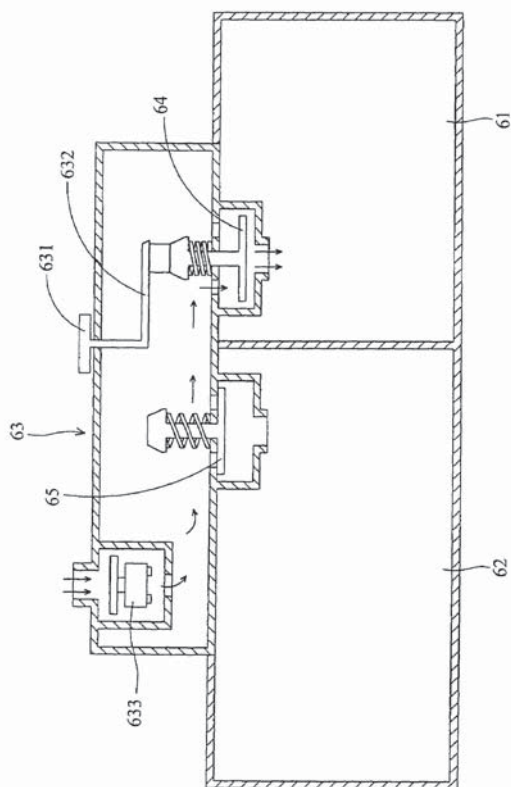


FIG. 6

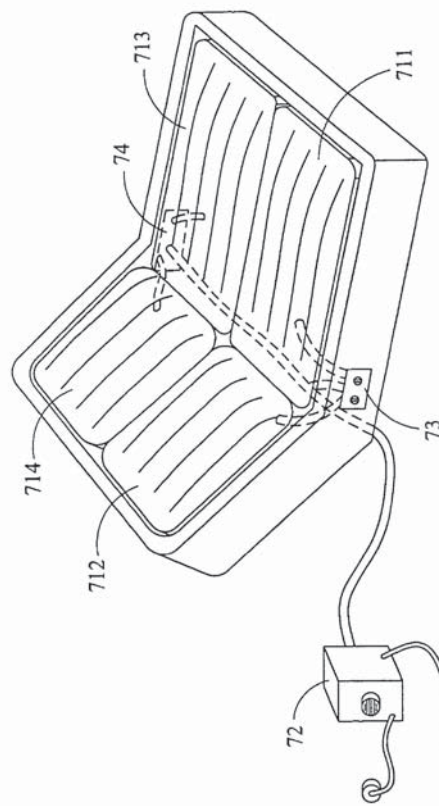


FIG. 7A

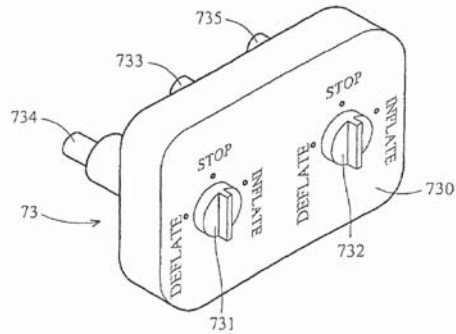


FIG. 7B

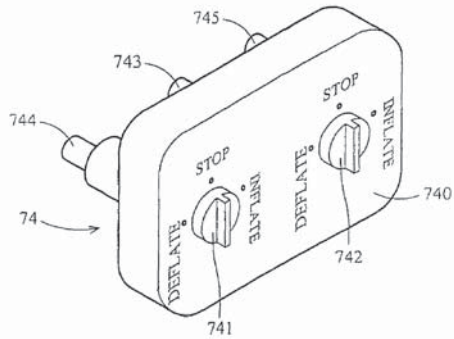


FIG. 7C

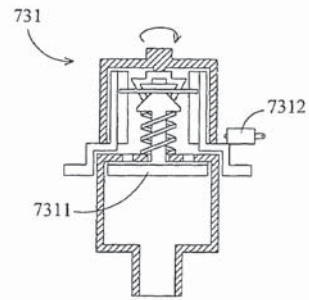


FIG. 7D

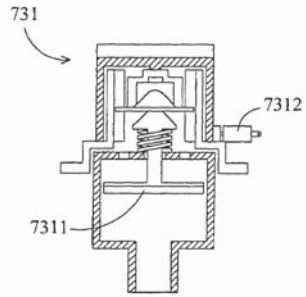


FIG. 7E

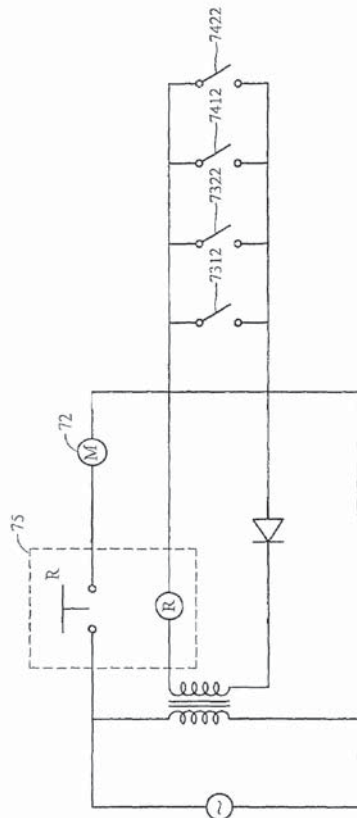


FIG. 7F

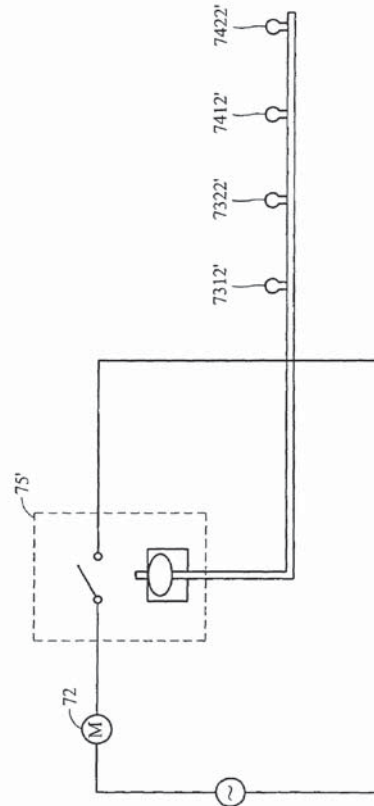


FIG. 7G

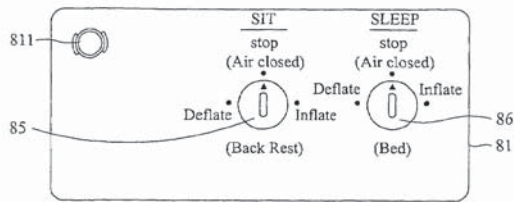


FIG. 8A

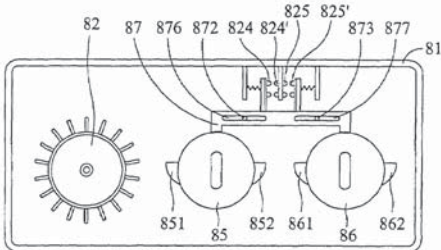


FIG. 8B

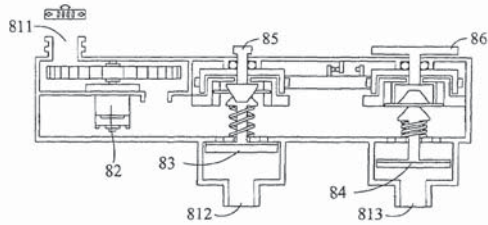


FIG. 8C

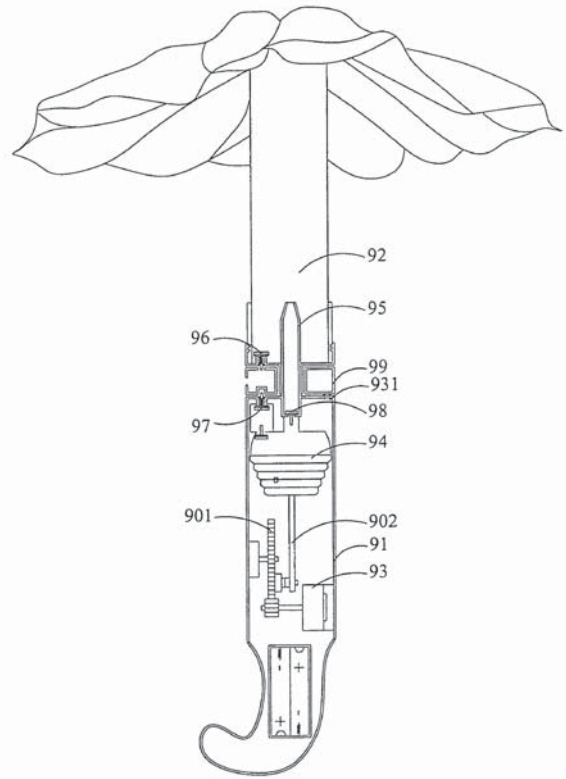


FIG. 9A

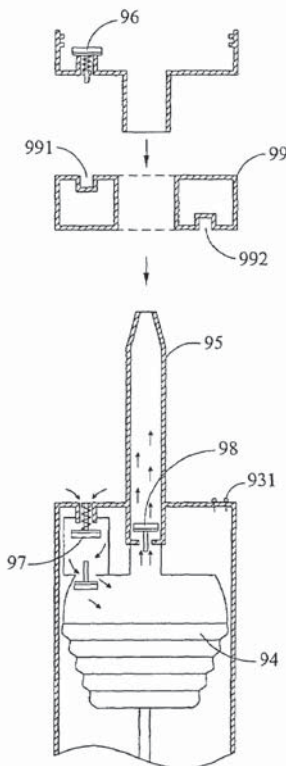


FIG. 9B

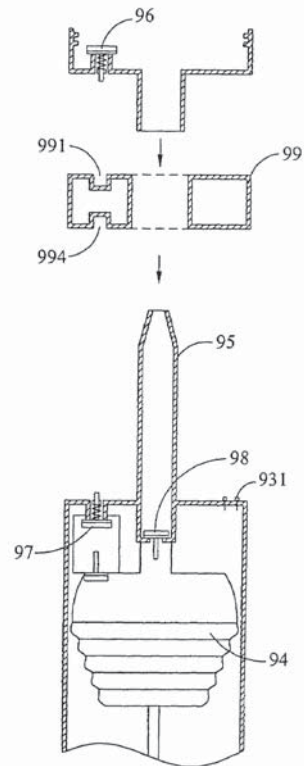


FIG. 9C

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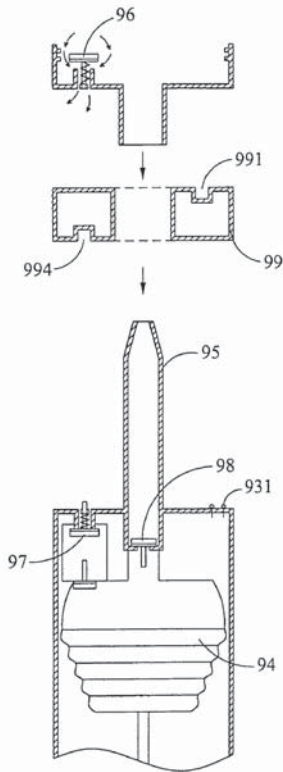


FIG. 9D

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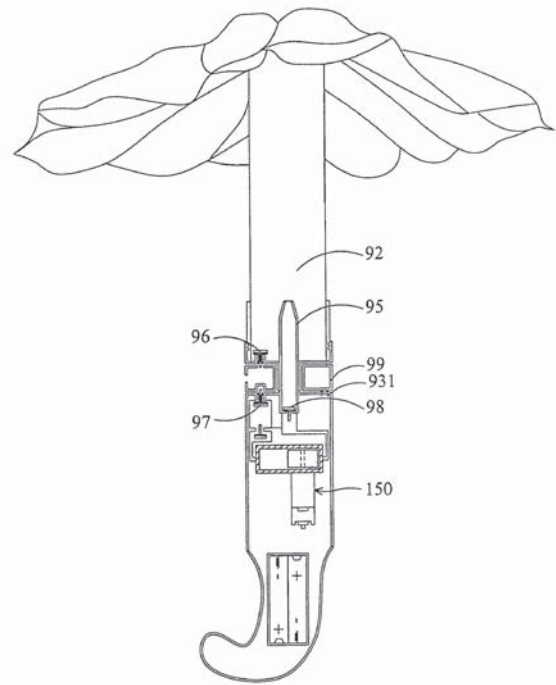


FIG. 10A

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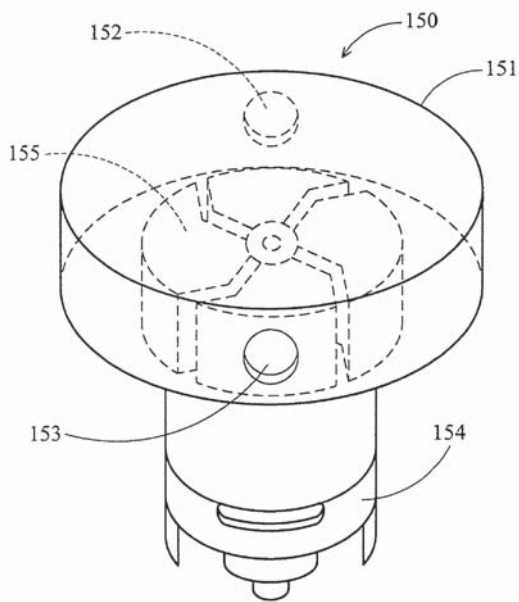


FIG. 10B

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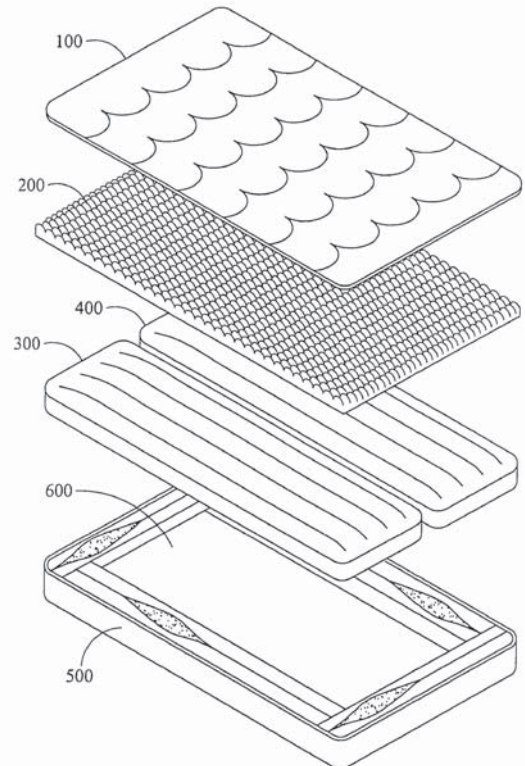


FIG. 11 (PRIOR ART)

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INFLATABLE PRODUCT PROVIDED WITH ELECTRIC AIR PUMP

CROSS-REFERENCE TO RELATED APPLICATION

This application is a divisional of U.S. application Ser. No. 09/886,030, filed Jan. 22, 2001.

BACKGROUND OF THE INVENTION

1. Field of the Invention
The present invention relates in general to an inflatable product provided with an electric air pump.
2. Description of the Related Art
Referring to FIG. 11, prior art provides a conventional air mattress for two people with a top fabric cover 100, a layer of foam 200, two inflatable chambers 300, 400, a frame 500 and a bottom fabric cover 600. The inflatable chambers 300, 400 are inflated by an electric air pump (not shown), which is separately provided, requiring users to carry two items, the air mattress itself, and an electric air pump. Inconvenience results, especially for outdoor use.
The present invention provides a modified air mattress, which has a built-in electric air pump eliminating the need for an external pump. Furthermore, operation of the air mattress of the present invention is easy.

SUMMARY OF THE INVENTION

An object of the present invention is to provide an air mattress, easily operated and conveniently carried.
In another embodiment of the invention, an inflatable product includes a first chamber, a pack, and a fan and motor received in the pack. The pack has an air intake connected to the outside of the first chamber and a first air outlet connected to the inside of the first chamber. A first valve for opening and closing the first air outlet is also provided, wherein the first valve is received in the pack. Air is pumped by the fan and motor from the outside of the first chamber through the air intake and the first valve and then into the first chamber from the first air outlet. The inflatable product may include a second chamber, in which case the pack is provided with a second air outlet connected to the second chamber so that the fan and motor pump air into the second chamber through the second air outlet. A second valve for opening and closing the second air outlet is preferably included. A two-way valve device may be connected between the first and second chamber so that the air in the first chamber flows into the second chamber through the two-way valve device.
A valve switch may be manually operated and include a cam element, a bar and a spring, the cam element rotatable between a first orientation and a second orientation. When the cam element is in the first orientation, the bar is depressed by the cam element, and the spring is compressed by the bar to open the first valve or the second valve. The cam element preferably has a recess, and when the cam element is in the second orientation, the bar is pushed by the spring and received in the recess to close the first valve or the second valve.
The air mattress of the present invention includes a chamber and an electric air pump for inflating the chamber. The air pump has an air intake and an air outlet. The air intake is connected to the outside of the chamber and the air outlet is connected to the inside of the chamber when the air pump is moved to first position. The air intake is connected

to the inside of the chamber and the air outlet is connected to the outside of the chamber when the air pump is moved to second position.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention can be more fully understood by reading the subsequent detailed description and examples with references made to the accompanying drawings, wherein:
FIG. 1A is a perspective diagram of an inflatable product in accordance with a first embodiment of the present invention.
FIG. 1B is an expanded view of the inflatable product of the first embodiment of the present invention.
FIG. 1C is an exploded diagram of the air pump and pump seat of FIG. 1B.
FIG. 1D is a schematic diagram of the air pump of the first embodiment during inflation.
FIG. 1E is a schematic diagram of the air pump of the first embodiment during deflation.
FIG. 2A depicts an air pump of a second embodiment of the present invention during inflation.
FIG. 2B is a sectional view of FIG. 2A along line II-II.
FIG. 2C depicts the air pump of the second embodiment of the present invention during deflation.
FIG. 3A depicts an air pump of a third embodiment of the present invention during inflation.
FIG. 3B depicts the air pump of FIG. 3A, with a part of the housing removed.
FIG. 3C depicts the air pump of the third embodiment of the present invention during deflation.
FIG. 3D depicts the air pump of FIG. 3C, with a part of the housing removed.
FIG. 4A is a perspective diagram of an inflatable product in accordance with a fourth embodiment of the present invention.
FIG. 4B is an expanded view of FIG. 4A.
FIG. 4C is a sectional view of FIG. 4B along line IV-IV.
FIG. 4D is a schematic diagram of the cam element and bar of the valve switch of the fourth embodiment, wherein the valve switch is closed.
FIG. 4E is a schematic diagram of the cam element and bar of the valve switch of the fourth embodiment, wherein the valve switch is opened.
FIG. 4F depicts the air pump assembly of the fourth embodiment during inflation.
FIG. 4G depicts the back support of the air mattress of the fourth embodiment, wherein the back support is filled with air.
FIG. 4H depicts the deflated back support of the air mattress of FIG. 4G.
FIG. 4I depicts a modified example of the back support of the air mattress of the fourth embodiment, wherein the back support is filled with air.
FIG. 4J depicts the deflated back support of the air mattress of FIG. 4I.
FIG. 4K depicts another modified example of the back support of the air mattress of the fourth embodiment, wherein the back support is filled with air.
FIG. 4L depicts the deflated back support of the air mattress of FIG. 4K.
FIG. 4M depicts another modified example of the back support of the air mattress of the fourth embodiment, wherein the back support is filled with air.
FIG. 4N depicts the deflated back support of the air mattress of FIG. 4M.

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Referring to FIG. 4A, an inflatable product of a fourth embodiment of the present invention is an air mattress which includes a mattress pad 41 comprising a chamber wall 41a, a back support 42 and an air pump assembly 43 built into the mattress pad 41 to inflate the mattress pad 41 and the back support 42. The back support 42 is inflated to raise the backrest of the mattress pad 41. Referring to FIGS. 4B and 4C, the air pump assembly 43 has a pack 430 comprising a pack wall 430a exposed to the outside of the chamber wall 41a, an interior region 430b, a fan and motor 435 received in the pack 430, a motor switch 433 mounted on the pack 430 to activate the fan and motor 435, two valves 436, 437 disposed in the pack 430, and two valve switches 431, 431' for opening/closing the valves 436, 437. The pack 430 has an air intake 4301, a first air outlet 4302 connected to the back support 42, and a second air outlet 4302' connected to the mattress pad 41. The valve switches 431, 431' have the same structure. Therefore, only the valve switch 431 is introduced and the description of the valve switch 431' is omitted. The valve switch 431 has a cap 4311, a cam element 4312, a bar 4313 and a spring 4314. The cam element 4312 is firmly connected to the cap 4311. When the cap 4311 is twisted, the cam element 4312 follows the rotation of the cap 4311. Referring to FIG. 4D, the cam element 4312 has a recess 4315 on its bottom, via which the cam element 4312 sits on the bar 4313.
To inflate the back support 42, the user turns on the motor switch 433 to activate the fan and motor 435. In addition, the user turns on the valve switch 431 by twisting the cap 4311. The cam element 4312 follows the cap 4311's rotation as shown in FIG. 4D. Then, the bar 4313 is depressed by the cam element 4312 as shown in FIG. 4E. Referring to FIG. 4F, the spring 4314 is compressed by the bar 4313 and the valve 461 is opened. Then, outside air is pumped into the back support 42 through the air intake 4301 and air outlet 4302 of the air pump assembly 43. Arrows indicate the path of airflow.

If the user further turns on the valve switch 431', then the mattress pad 41 is inflated.
Referring to FIG. 4G, the back support 42 is inflated to raise the backrest of the mattress pad 41. Referring to FIG. 4H, the backrest of the mattress pad 41 is lowered when the back support 42 is deflated. It is noted that the cross section of the back support 42 is V-shaped. By such an arrangement, the mattress pad 41 is flat enough that a user cannot detect the presence of the deflated back support 42.

FIGS. 4I and 4J depict a modified example of the back support of the air mattress, wherein the back support 44 has a flexible chamber 442 of a triangular cross section and an elastic string 441 binding the chamber 442. When the chamber 442 is filled with the air, the elastic string 441 is stretched. When the chamber 442 is deflated, the elastic string 441 automatically contracts to collapse the chamber 442.

FIGS. 4K and 4L depict another modified example of the back support of the air mattress, wherein the back support 46 has a flexible chamber 464, a frame 463 pivoted to the mattress pad 47 and connected to the chamber 464, an elastic string 461 fixed to the frame 463 for binding the chamber 464, and round sliders 462 on the bottom of the frame 463. When the chamber 464 is filled with air, the elastic string 461 is stretched. When the chamber 464 is deflated, the elastic string 461 automatically contracts to collapse the chamber 464. Then, the chamber 464 pulls the frame 463. The frame 463 slides on the ground via the round sliders 462 and rotates toward the mattress pad 47 to collapse the chamber 464.

FIGS. 4M and 4N depict another modified example of the back support of the air mattress, wherein the back support 48 has a flexible chamber 481, a first frame 483, a second frame 484 hinged to the first frame 483, and an elastic string 482 fixed to the frames 483, 484 to bind the chamber 481. The flexible chamber 481 is sandwiched between the frames 483, 484. When the chamber 484 is filled with air, the elastic string 482 is stretched and the frames 483, 484 are spread. When the chamber 484 is deflated, the elastic string 482 automatically contracts to collapse the chamber 481. Also, the frames 483, 484 are closed to collapse the chamber 481.
Referring to FIG. 5A, an inflatable product of a fifth embodiment of the present invention includes two inflatable chambers 51, 52, an air pump assembly 53 and a two-way valve device 54. The air pump assembly 53 is used to inflate the chambers 51 and 52 via the two-way valve device 54, wherein the two-way valve device 54 is connected to the chamber 52 via a pipe 55. Also referring to FIGS. 5B and 5C, the air pump assembly 53 has a motor switch 533 and an air intake 531 on its front surface, and an air outlet 532 on its rear surface. The two-way valve device 54 has a valve switch 543 on its front surface, an air intake 541 and an air outlet 542 on its rear surface. During inflation, the user turns on the motor switch 533 to pump air into the chamber 51 through the air intake 531 and air outlet 532. To further inflate the chamber 52, the valve switch 54 is turned on so that air in the chamber 51 flows into the chamber 52 through the two-way valve device 54.

Referring to FIG. 6, an inflatable product of a sixth embodiment of the present invention includes two inflatable chambers 61, 62 and an air pump assembly 63. The air pump assembly 63 inflates the chambers 61, 62 via two check valves 64, 65, respectively. The air pump assembly 63 has a fan and motor 633, a valve switch 631 and a cantilever arm 632 connected to the valve switch 631. To inflate the chamber 61, the user twists the valve switch 631 so that the cantilever arm 632 depresses the valve 64. The valve 64 is thus opened. Arrows indicate the path of airflow. Similarly, the user twists the valve switch 631 to open the valve 65 for the cantilever arm 632, when the chamber 62 is inflated.

Referring to FIG. 7A, an inflatable product of a seventh embodiment of the present invention includes four inflatable chambers 711, 712, 713, 714, an air pump 72, a first control pack 73 for controlling the air pump 72 to inflate the chambers 711, 712, and a second control pack 74 for controlling the air pump 72 to inflate the chambers 713, 714. Referring to FIG. 7B, the first control pack 73 has a pack body 730, two switches 731, 732, an air intake 733 connected to the air pump 72 and two air outlets 734, 735 respectively connected to the chambers 713, 714. Referring to FIG. 7C, the second control pack 74 has the same structure as the first control pack 73. The second control pack 74 has a pack body 740, two switches 741, 742, an air intake 743 connected to the air pump 72 and two air outlets 744, 745 respectively connected to the chambers 711, 712. Referring to FIG. 7D, the switch 731 is connected to a valve 7311 while a micro switch 7312 is provided beside the switch 731. When the switch 731 is rotated to the "INFLATE" position, the valve 7311 is opened and the micro switch 7312 is turned on as shown in FIG. 7E. Other switches 732, 741, 742 have the same structure as the switch 731, thereby having micro switches beside. Furthermore, referring to FIG. 7F, when any of the micro switches 7312, 7322, 7412, 7422 is turned on, a relay switch 75 is actuated and turned on. Then, the air pump 72 is supplied with power to inflate the corresponding chambers 711, 712, 713, 714.

FIG. 8A is a perspective diagram of an inflatable product in accordance with a fifth embodiment of the present invention.
FIG. 8B is an expanded view of FIG. 8A.
FIG. 8C is a back view of FIG. 8B.
FIG. 8D depicts an inflatable product in accordance with a sixth embodiment of the present invention.
FIG. 7B depicts the first control pack of the inflatable product of FIG. 7A.
FIG. 7C depicts the second control pack of the inflatable product of FIG. 7A.
FIGS. 7D and 7E depict the operation of the switch of the first control pack of FIG. 7B.
FIG. 7F depicts an control circuit for activating the air pump of FIG. 7A.
FIG. 7G depicts a modified control circuit of FIG. 7F.
FIG. 8A is a front view of the operating panel of the air pump assembly in accordance with an eighth embodiment of the present invention.
FIG. 8B is the front view of the air pump assembly of FIG. 8A, with the operating panel removed.
FIG. 8C is a bottom view of FIG. 8B.
FIG. 9A depicts an inflatable product of a ninth embodiment of the present invention.
FIG. 9B is an expanded view of the inflatable product of FIG. 9A, during inflation.
FIG. 9C is an expanded view of the inflatable product of FIG. 9A, in stop mode.
FIG. 9D is an expanded view of the inflatable product of FIG. 9A, during deflation.
FIG. 10A shows a modified inflatable umbrella of the ninth embodiment of the present invention.
FIG. 10B is a perspective diagram of a fan assembly of FIG. 10A.
FIG. 11 is an exploded perspective diagram of a conventional air mattress.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1A and 1B, an inflatable product of a first embodiment of the present invention has an inflatable chamber 10, a pump seat 11 mounted on the chamber 10, an air pump 12 carried by the pump seat 11, two holding elements 13, 13' to hold the air pump 12, and two covers 14, 14' for covering the vents 131, 131' provided on the holding elements 13. Referring to FIG. 1C, the seat 11 has two holes 111, 112 on its bottom, through which air enters the chamber 10. The air pump 12 has a substantially rolling-pin-shaped housing with a fan and motor (not shown) inside. An air intake 121 and an air outlet 122 are provided at opposite ends of the housing. The housing of the air pump 12 has a rib 123 on its outer surface, wherein the rib 123 extends in the axial direction of the housing. Referring to FIG. 1D, the air pump 12 is carried by the seat 11 with the rib 123 resting on the seat 11. Then, the holding elements 13 are screwed to the seat 11 for holding the air pump 12.
During inflation, the air pump 12 pumps air into the inflatable product. Air flows through the vent 131 of the holding element 13, the air intake 121 and air outlet 122 of the air pump 12, and the hole 112 on the bottom of the seat 11. Air then flows into the inflatable product via the hole 112 on the bottom of the seat 11.
During deflation, the air pump 12 is rotated in direction X until the rib 123 rests on the seat 11 at another side. As

shown in FIG. 1E, the air intake 121 faces down and the air outlet 122 faces up so that the air pump 12 can pump air out of the inflatable product. Air flows through the hole 111 of the seat 11, the air intake 121 and air outlet 122 of the air pump 12, and then out from the vent 131' of the holding element 13'.

Referring to FIG. 2A, an inflatable product of a second embodiment of the present invention is provided with a rotatable switch 21, an air pump 22, a piping system 23 and a cover 24. On the top surface of the switch 21, "INFLATE," "STOP" and "DEFLATE" settings appear. The air pump 22 is firmly connected to the switch 21. The air pump 22 thus follows the switch 21's rotation when twisted. Referring to FIG. 2B, the air pump 22 has a substantially rolling-pin-shaped housing 225 with a fan and motor 223 inside. An air intake 221 and an air outlet 222 are provided at opposite ends of the housing. The piping system 23 includes a main pipe 238, two side pipes 236, 237 and a vent 239. The main pipe 238 is connected to the outside via the vent 239 and connected to the air pump 22 in the housing 225 via the side pipes 236, 237. The cover 24 is used to close the vent 239.
During inflation, the switch 21 is rotated to "INFLATE." The air intake 221 is switched to connect the side pipe 236, while the side pipe 237 is closed by the housing 225 of the air pump 22. The air pump 22 pumps air into the inflatable product in accordance with a path as indicated by the arrows. In detail, air flows through the vent 239, main pipe 238, side pipe 236 and air intake 221, and out from the air outlet 222.
When inflation is finished, the user rotates the switch 21 to "STOP." The air pump 22 stops. Also, the air intake 221 and air outlet 222 are closed by the housing 225 of the air pump 22.
During deflation, the switch 21 is rotated to "DEFLATE." As shown in FIG. 2C, the air outlet 222 is switched to connect the side pipe 237, while the side pipe 236 is closed by the housing 225 of the air pump 22. The air pump 22 evacuates air from the inflatable product in accordance with a path as indicated by arrows. In detail, air flows through the air intake 221, air outlet 222, side pipe 237 and main pipe 238, and out from the vent 239.

Referring to FIGS. 3A and 3B, an inflatable product of a third embodiment of the present invention is provided with a housing 31, a fan and motor 33, a switching pipe 32, a flap 36 and a cover 35. The fan and motor 33 is received in the housing 31. The flap 36 is firmly connected to the switching pipe 32. Therefore, when the switching pipe 32 is rotated, the flap 36 follows. An air intake 311 and an air outlet 312 are provided on the top surface of the housing 31, while an air intake 314 and air outlet 313 are provided on the bottom surface of the housing 31. During inflation, the switching pipe 32 is connected to the air outlet 312 on the top surface of the housing 31. The cover 35 is removed from the air intake 311. The inflatable product (not shown) is inflated by the fan and motor 33. Air flows through the air intake 311 and the air outlet 312, and into the inflatable product.
Referring to FIGS. 3C and 3D, During deflation, the switching pipe 32 is switched from the air outlet 312 to the air intake 311 on the top surface of the housing 31. Also, the flap 36 follows the switching pipe 32 to rotate to close the air outlet 313 on the bottom surface of the housing 31. The air in the inflatable product is evacuated by the fan and motor 33. The path of the airflow is indicated by arrows. Air flows through the air intake 311 and the air outlet 312, and into the air intake 311, and into the housing 31. Then, air flows out from the air outlet 312.

Referring to FIGS. 3C and 3D, During deflation, the switching pipe 32 is switched from the air outlet 312 to the air intake 311 on the top surface of the housing 31. Also, the flap 36 follows the switching pipe 32 to rotate to close the air outlet 313 on the bottom surface of the housing 31. The air in the inflatable product is evacuated by the fan and motor 33. The path of the airflow is indicated by arrows. Air flows through the air intake 311 and the air outlet 312, and into the air intake 311, and into the housing 31. Then, air flows out from the air outlet 312.
Referring to FIGS. 3C and 3D, During deflation, the switching pipe 32 is switched from the air outlet 312 to the air intake 311 on the top surface of the housing 31. Also, the flap 36 follows the switching pipe 32 to rotate to close the air outlet 313 on the bottom surface of the housing 31. The air in the inflatable product is evacuated by the fan and motor 33. The path of the airflow is indicated by arrows. Air flows through the air intake 311 and the air outlet 312, and into the air intake 311, and into the housing 31. Then, air flows out from the air outlet 312.
Referring to FIGS. 3C and 3D, During deflation, the switching pipe 32 is switched from the air outlet 312 to the air intake 311 on the top surface of the housing 31. Also, the flap 36 follows the switching pipe 32 to rotate to close the air outlet 313 on the bottom surface of the housing 31. The air in the inflatable product is evacuated by the fan and motor 33. The path of the airflow is indicated by arrows. Air flows through the air intake 311 and the air outlet 312, and into the air intake 311, and into the housing 31. Then, air flows out from the air outlet 312.
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Referring to FIGS. 3C and 3D, During deflation, the switching pipe 32 is switched from the air outlet 312 to the air intake 311 on the top surface of the housing 31. Also

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chamber through the air intake into the interior region of the pack, then through the first valve and first air outlet into the first chamber.

2. The inflatable product as claimed in claim 1, further including a second chamber; and the pack further having a second air outlet communicating the interior region of the pack to the second chamber, wherein, on activation of the fan and motor to inflate the second chamber, air is pumped into the second chamber through the second air outlet.

3. The inflatable product as claimed in claim 2, further including a second valve for opening and closing the second air outlet.

4. The inflatable product as claimed in claim 3, further including a valve switch to selectively open the first valve or the second valve.

5. The inflatable product as claimed in claim 4, wherein the valve switch comprises a cantilever arm, and the cantilever arm is rotated to selectively depress the first valve or the second valve for selectively opening the first valve or the second valve.

6. The inflatable product as claimed in claim 1, further including a second chamber and a two-way valve device connected between the first and second chamber so that the air in the first chamber flows into the second chamber through the two-way valve device.

7. The inflatable product as claimed in claim 1, further including a valve switch to open the first valve.

8. The inflatable product as claimed in claim 7, wherein the valve switch includes a cam element, a bar and a spring,

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the cam element is rotatable between a first orientation and a second orientation, and when the cam element is in the first orientation, the bar is depressed by the cam element, and the spring is compressed by the bar to open the first valve.

9. The inflatable product as claimed in claim 8, wherein the cam element has a recess, and when the cam element is in the second orientation, the bar is pushed by the spring and received in the recess to close the first valve.

10. The inflatable product as claimed in claim 7, wherein the valve switch includes a spring, the valve switch is moveable between a first orientation and a second orientation, and when the valve switch is in the first orientation, the spring is compressed to open the first valve.

11. The inflatable product as claimed in claim 1, wherein the first valve is a two-way valve.

12. The inflatable product as claimed in claim 1, wherein the first valve is arranged to allow manual opening and closing of the first air outlet.

13. The inflatable product as claimed in claim 1, wherein the pack comprises a pack wall exposed to the outside of the first chamber, and the air intake communicates the outside of the first chamber to the interior region of the pack through the pack wall.

14. The inflatable product as claimed in claim 13, further comprising a control switch to activate the motor, wherein the control switch is disposed on the pack wall.

* * * * *



Exhibit C

(12) **United States Patent**
Wang

(10) **Patent No.:** **US 7,246,394 B2**
(45) **Date of Patent:** ***Jul. 24, 2007**

(54) **INFLATABLE PRODUCT WITH BUILT-IN HOUSING AND SWITCHING PIPE**

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(73) **Assignee:** **Team Worldwide Corporation, Taipei (TW)**

(*) **Notice:** Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 0 days.

This patent is subject to a terminal disclaimer.

(21) **Appl. No.:** **11/326,829**

(22) **Filed:** **Jan. 7, 2006**

(65) **Prior Publication Data**
US 2006/0112492 A1 Jun. 1, 2006

Related U.S. Application Data

(62) Division of application No. 09/886,030, filed on Jun. 22, 2001, now Pat. No. 6,990,700.

(51) **Int. Cl.** **A47C 27/08** (2006.01)

(52) **U.S. Cl.** **5/713; 5/708; 5/655.3**

(58) **Field of Classification Search** **5/706, 5/708, 713, 655.3; 417/411, 315, 238-239; 137/625.22, 565.12**

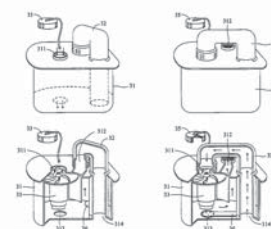
See application file for complete search history.

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23 Claims, 33 Drawing Sheets



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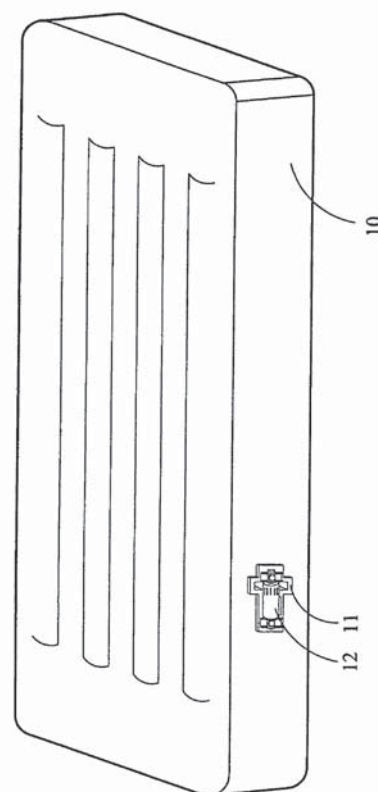


FIG. 1A

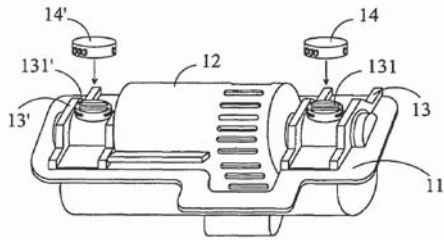


FIG. 1B

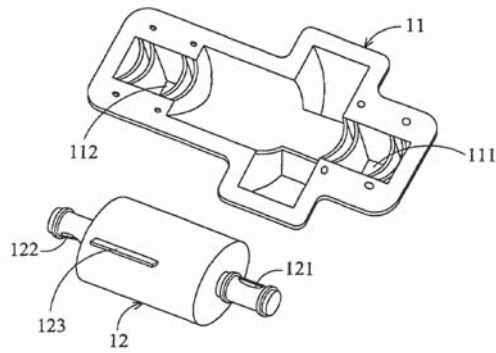


FIG. 1C

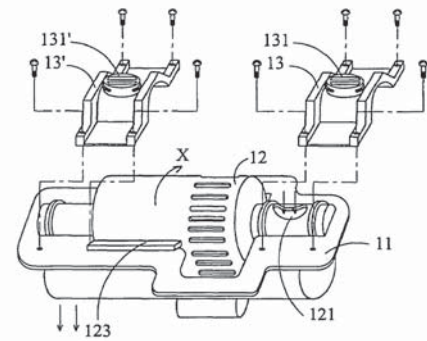


FIG. 1D

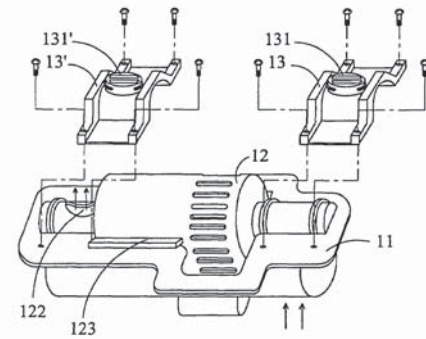


FIG. 1E

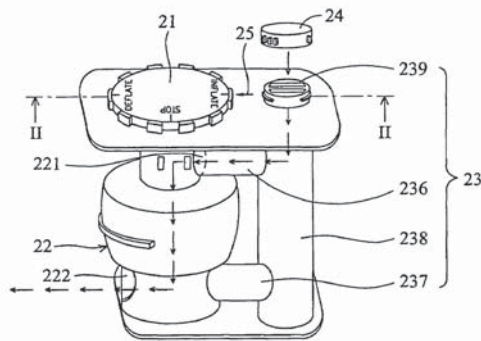


FIG. 2A

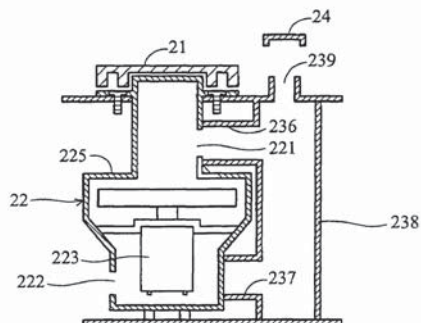


FIG. 2B

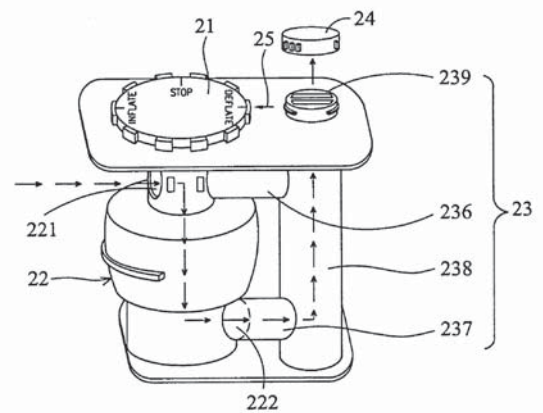


FIG. 2C

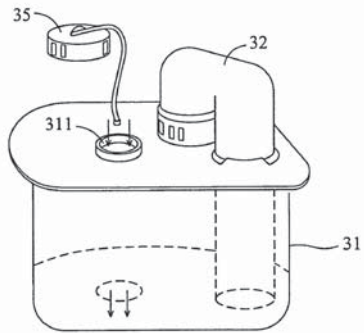


FIG. 3A

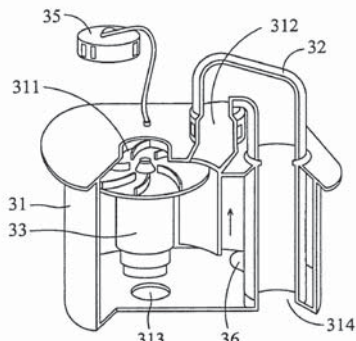


FIG. 3B

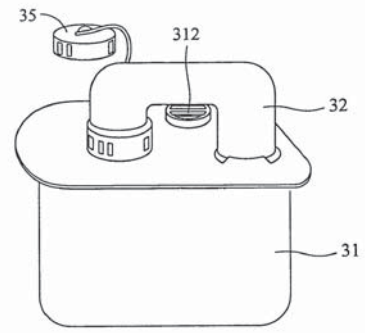


FIG. 3C

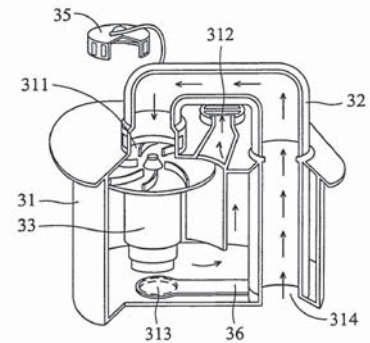


FIG. 3D

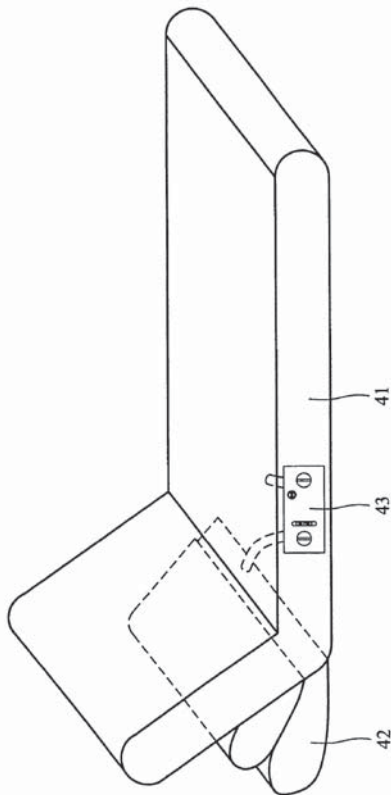


FIG. 4A

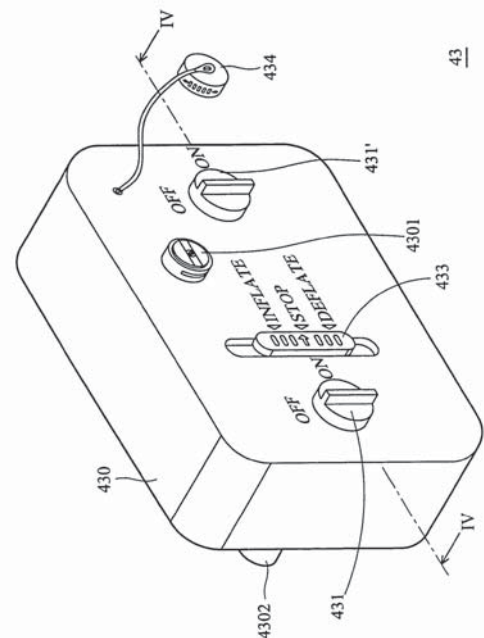


FIG. 4B

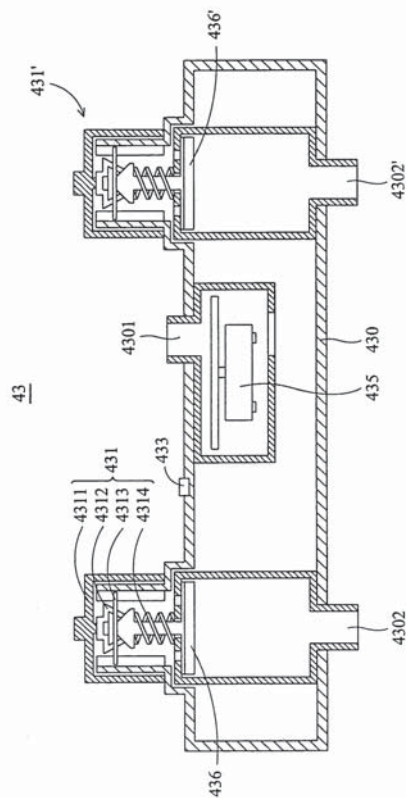


FIG. 4C

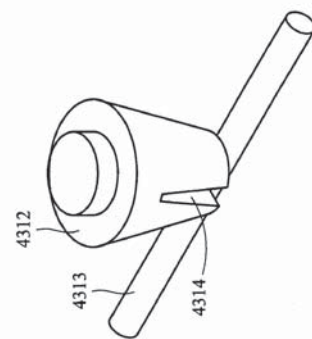


FIG. 4E

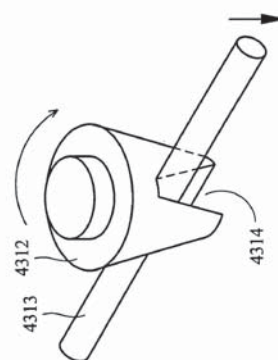


FIG. 4D

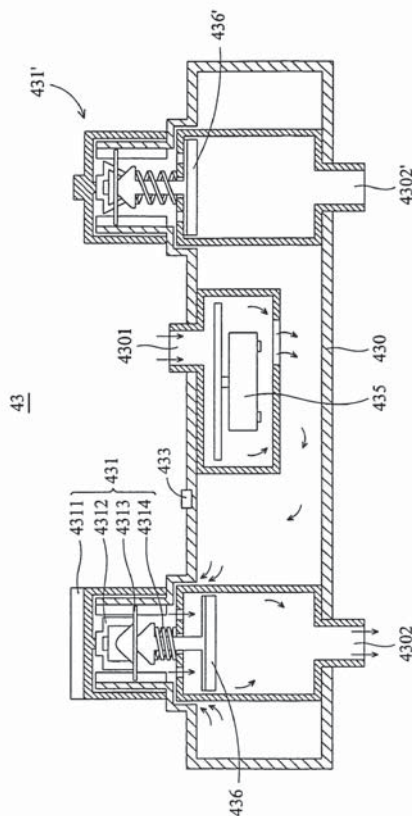


FIG. 4F

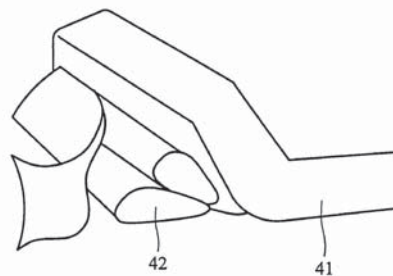


FIG. 4G

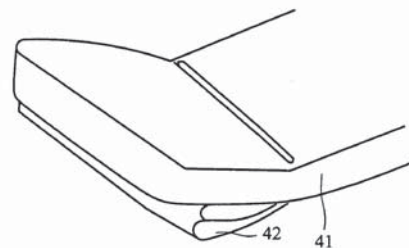


FIG. 4H

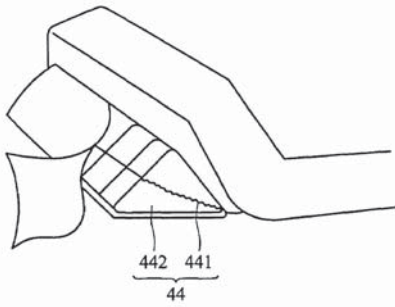


FIG. 4I

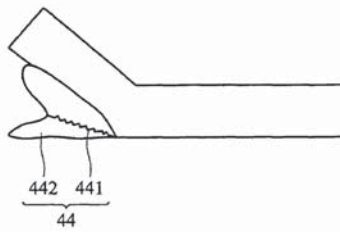


FIG. 4J

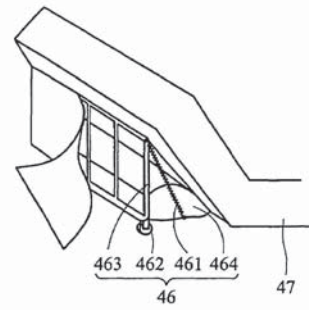


FIG. 4K

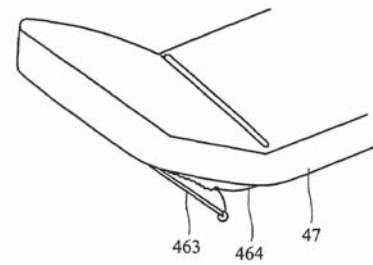


FIG. 4L

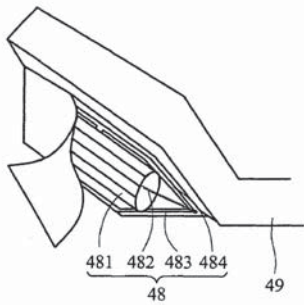


FIG. 4M

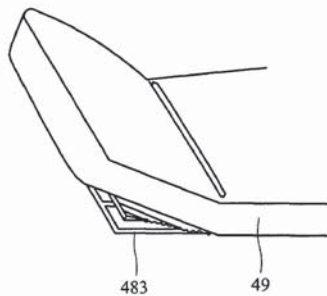


FIG. 4N

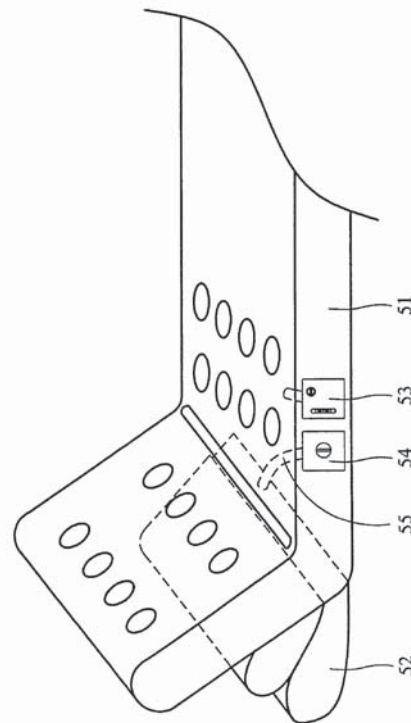


FIG. 5A

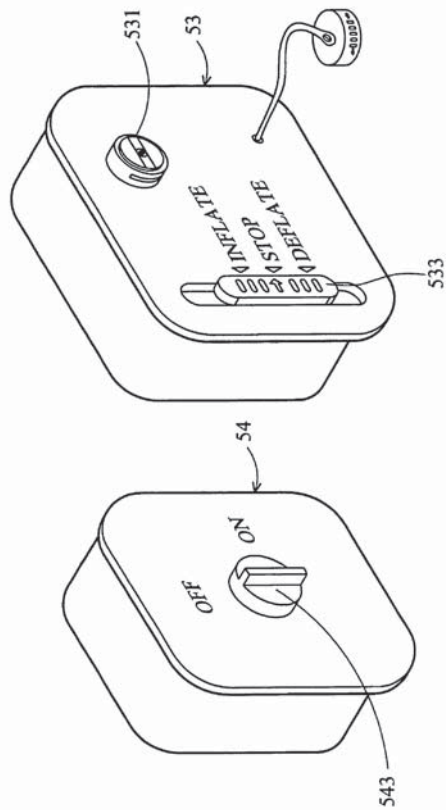


FIG. 5B

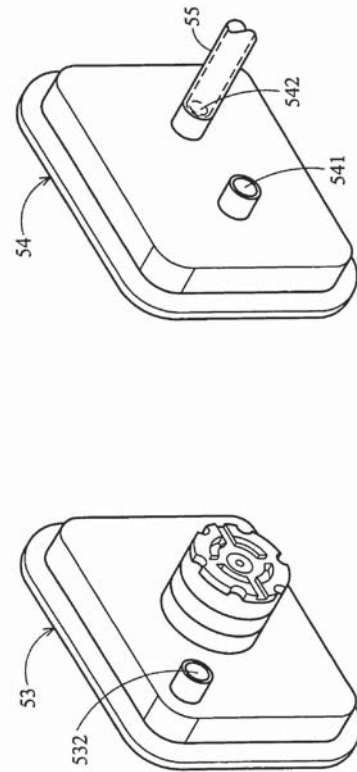


FIG. 5C

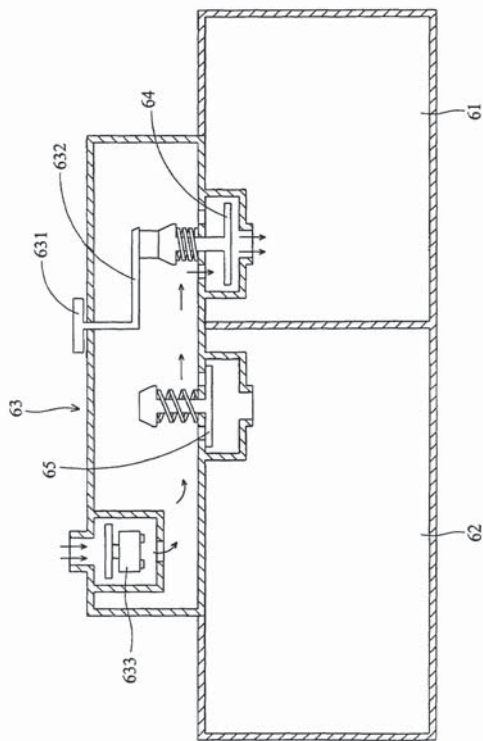


FIG. 6

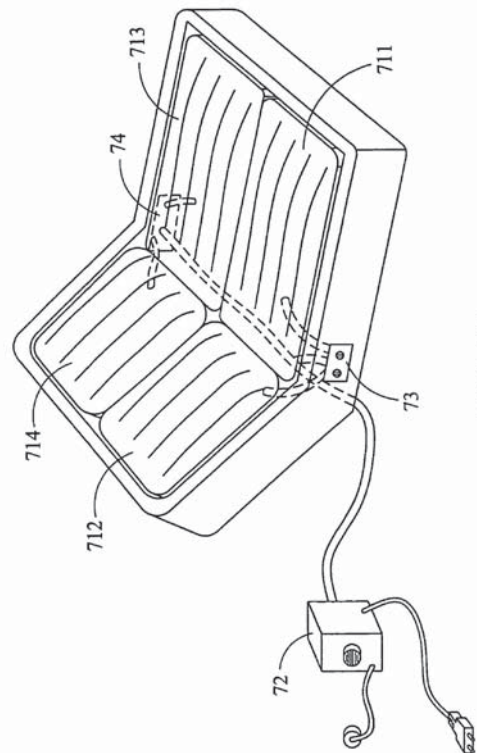


FIG. 7A

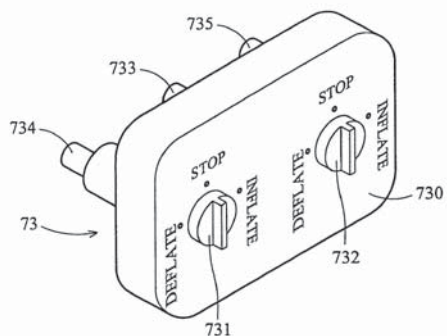


FIG. 7B

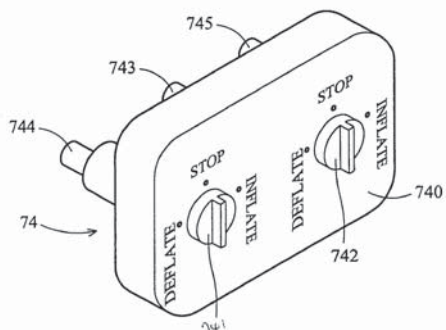


FIG. 7C

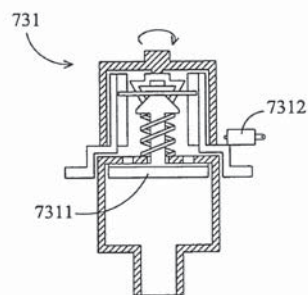


FIG. 7D

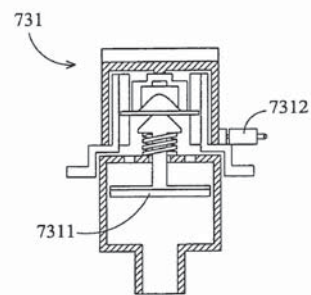


FIG. 7E

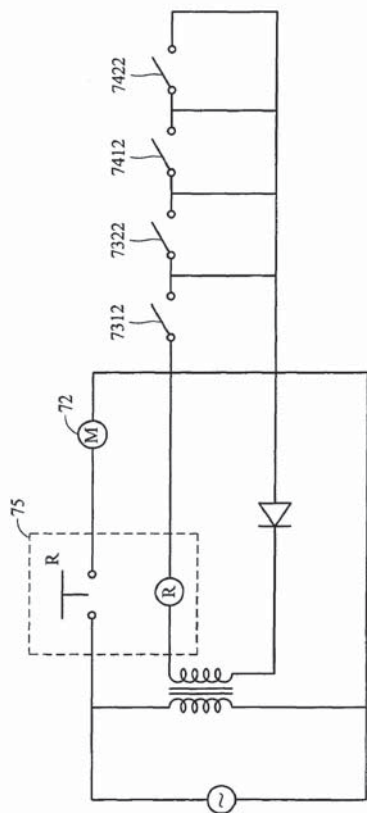


FIG. 7F

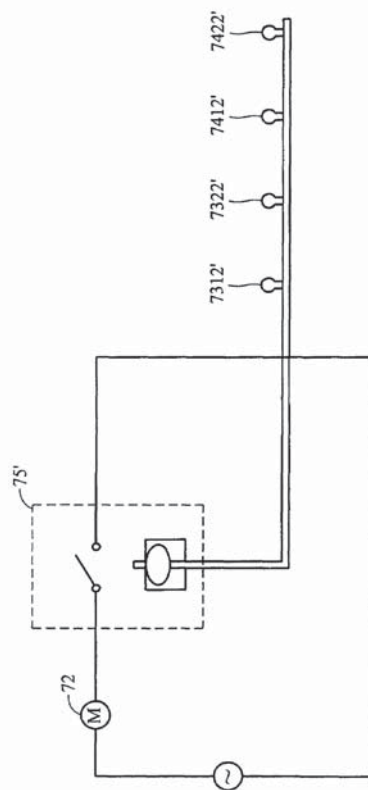


FIG. 7G

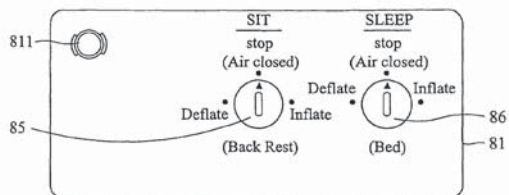


FIG. 8A

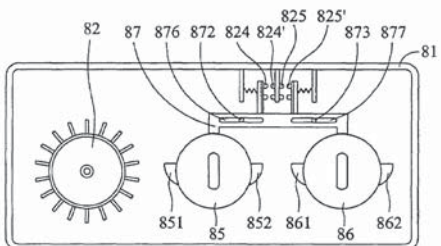


FIG. 8B

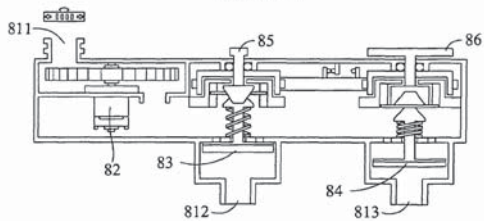


FIG. 8C

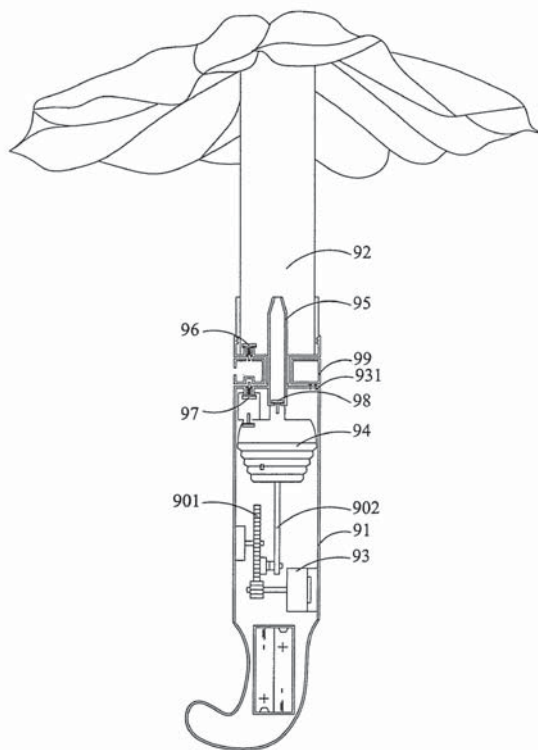


FIG. 9A

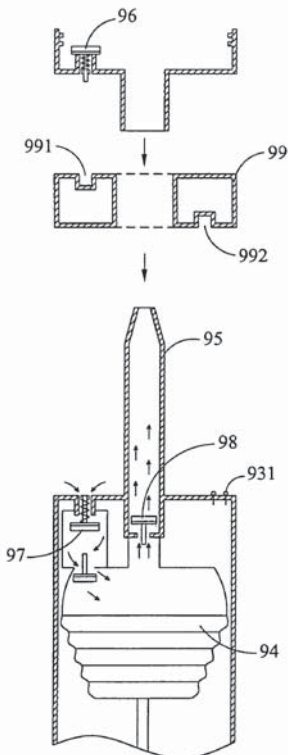


FIG. 9B

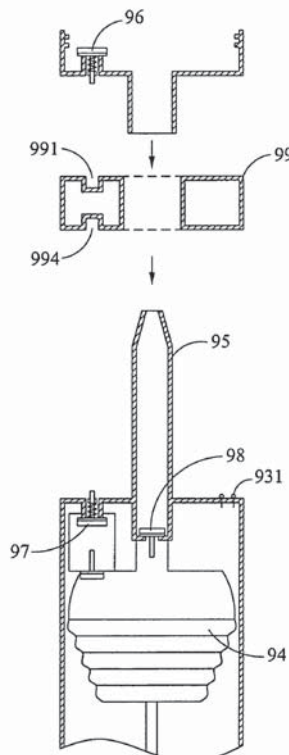


FIG. 9C

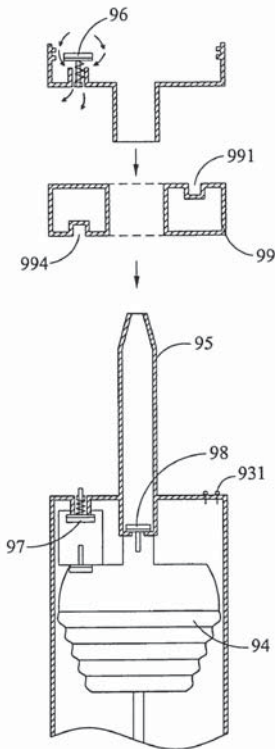


FIG. 9D

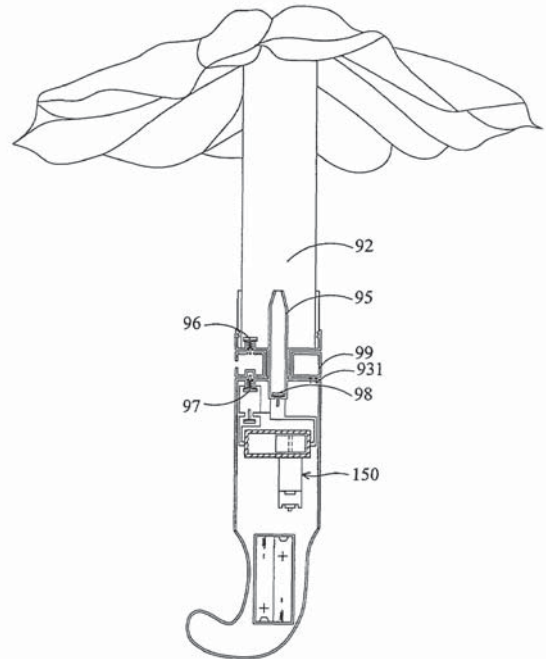


FIG. 10A

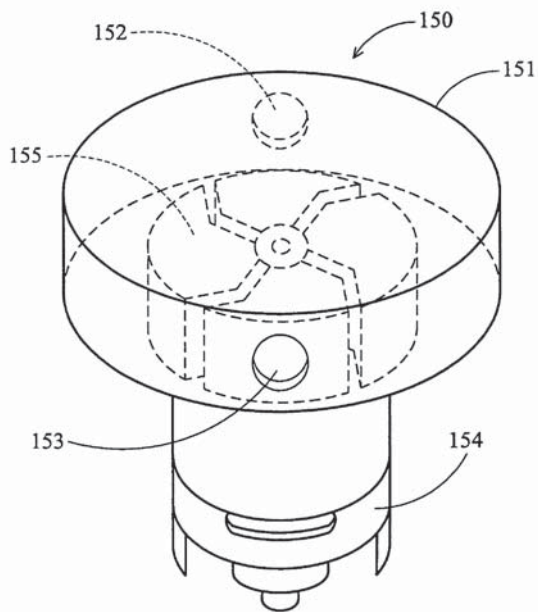


FIG. 10B

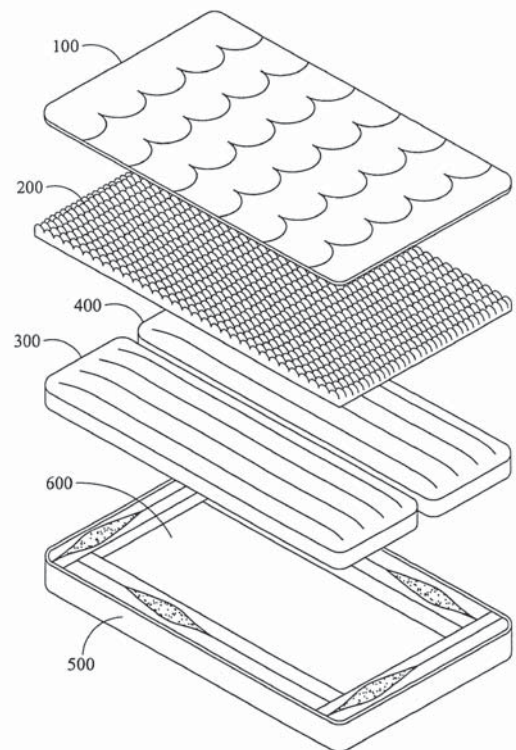


FIG. 11 (PRIOR ART)

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INFLATABLE PRODUCT WITH BUILT-IN HOUSING AND SWITCHING PIPE

CROSS-REFERENCE TO RELATED APPLICATION

This application is a divisional of U.S. application No. Ser. No. 09/886,030, filed Jun. 22, 2001, now U.S. Pat. No. 6,990,700.

BACKGROUND OF THE INVENTION

1. Field of the Invention
The present invention relates in general to an inflatable product provided with an electric air pump.
2. Description of the Related Art
Referring to FIG. 11, prior art provides a conventional air mattress for two people with a top fabric cover 100, a layer of foam 200, two inflatable chambers 300, 400, a frame 500 and a bottom fabric cover 600. The inflatable chambers 300, 400 are inflated by an electric air pump (not shown), which is separately provided, requiring users to carry two items, the air mattress itself, and an electric air pump. Inconvenience results, especially for outdoor use.
The present invention provides a modified air mattress, which has a built-in electric air pump eliminating the need for an external pump. Furthermore, operation of the air mattress of the present invention is easy.

SUMMARY OF THE INVENTION

An object of the present invention is to provide an air mattress, easily operated and conveniently carried.
The air mattress of the present invention includes a chamber and an electric air pump for inflating the chamber. The air pump has an air intake and an air outlet. The air intake is connected to the outside of the chamber and the air outlet is connected to the inside of the chamber when the air pump is moved to first position. The air intake is connected to the outside of the chamber and the air outlet is moved to second position.

BRIEF DESCRIPTION OF THE DRAWINGS

The present invention can be more fully understood by reading the subsequent detailed description and examples with references made to the accompanying drawings, wherein:
FIG. 1A is a perspective diagram of an inflatable product in accordance with a first embodiment of the present invention;
FIG. 1B is an expanded view of the inflatable product of the first embodiment of the present invention;
FIG. 1C is an exploded diagram of the air pump and pump seat of FIG. 1B;
FIG. 1D is a schematic diagram of the air pump of the first embodiment during inflation;
FIG. 1E is a schematic diagram of the air pump of the first embodiment during deflation;
FIG. 2A depicts an air pump of a second embodiment of the present invention during inflation;
FIG. 2B is a sectional view of FIG. 2A along line II-II;
FIG. 2C depicts the air pump of the second embodiment of the present invention during deflation;
FIG. 3A depicts an air pump of a third embodiment of the present invention during inflation;

FIG. 3B depicts the air pump of FIG. 3A, with a part of the housing removed;
FIG. 3C depicts the air pump of the third embodiment of the present invention during deflation;
FIG. 3D depicts the air pump of FIG. 3C, with a part of the housing removed;
FIG. 4A is a perspective diagram of an inflatable product in accordance with a fourth embodiment of the present invention;
FIG. 4B is an expanded view of FIG. 4A;
FIG. 4C is a sectional view of FIG. 4B along line IV-IV;
FIG. 4D is a schematic diagram of the cam element and bar of the valve switch of the fourth embodiment, wherein the valve switch is closed;
FIG. 4E is a schematic diagram of the cam element and bar of the valve switch of the fourth embodiment, wherein the valve switch is opened;
FIG. 4F depicts the air pump assembly of the fourth embodiment during inflation;
FIG. 4G depicts the back support of the air mattress of the fourth embodiment, wherein the back support is filled with air;
FIG. 4H depicts the deflated back support of the air mattress of FIG. 4G;
FIG. 4I depicts a modified example of the back support of the air mattress of the fourth embodiment, wherein the back support is filled with air;
FIG. 4J depicts the deflated back support of the air mattress of FIG. 4I;
FIG. 4K depicts another modified example of the back support of the air mattress of the fourth embodiment, wherein the back support is filled with air;
FIG. 4L depicts the deflated back support of the air mattress of FIG. 4K;
FIG. 4M depicts another modified example of the back support of the air mattress of the fourth embodiment, wherein the back support is filled with air;
FIG. 4N depicts the deflated back support of the air mattress of FIG. 4M;
FIG. 5A is a perspective diagram of an inflatable product in accordance with a fifth embodiment of the present invention;
FIG. 5B is an expanded view of FIG. 5A;
FIG. 5C is a back view of FIG. 5B;
FIG. 6 depicts an inflatable product in accordance with a sixth embodiment of the present invention;
FIG. 7A depicts an inflatable product in accordance with a seventh embodiment of the present invention;
FIG. 7B depicts the first control pack of the inflatable product of FIG. 7A;
FIG. 7C depicts the second control pack of the inflatable product of FIG. 7A;
FIGS. 7D and 7E depict the operation of the switch of the first control pack of FIG. 7B;
FIG. 7F depicts a control circuit for activating the air pump of FIG. 7A;
FIG. 7G depicts a modified control circuit of FIG. 7F;
FIG. 8A is a front view of the operating panel of the air pump assembly in accordance with an eighth embodiment of the present invention;
FIG. 8B is the front view of the air pump assembly of FIG. 8A, with the operating panel removed;
FIG. 8C is a bottom view of FIG. 8C;
FIG. 9A depicts an inflatable product of a ninth embodiment of the present invention during inflation;
FIG. 9B is an expanded view of the inflatable product of FIG. 9A, during inflation;

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cam element 4312 as shown in FIG. 4I. Referring to FIG. 4F, the spring 4314 is compressed by the bar 4313 and the valve 461 is opened. Then, outside air is pumped into the back support 42 through the air intake 4301 and air outlet 4302 of the air pump assembly 43. Arrows indicate the path of airflow.
If the user further turns on the valve switch 431', then the mattress pad 41 is inflated.
Referring to FIG. 4G, the back support 42 is inflated to raise the backrest of the mattress pad 41. Referring to FIG. 4H, the backrest of the mattress pad 41 is lowered when the back support 42 is deflated. It is noted that the cross section of the back support 42 is V-shaped. By such an arrangement, the mattress pad 41 is flat enough that a user cannot detect the presence of the deflated back support 42.
FIGS. 4I and 4J depict a modified example of the back support of the air mattress, wherein the back support 44 has a flexible chamber 442 of a triangular cross section and an elastic string 441 binding the chamber 442. When the chamber 442 is filled with the air, the elastic string 441 is stretched. When the chamber 442 is deflated, the elastic string 441 automatically contracts to collapse the chamber 442.
FIGS. 4K and 4L depict another modified example of the back support of the air mattress, wherein the back support 46 has a flexible chamber 464, a frame 463 provided to the mattress pad 47 and connected to the chamber 464, an elastic string 461 fixed to the frame 463 for binding the chamber 464, and round slider 462 mounted on the bottom of the frame 463. When the chamber 464 is filled with air, the elastic string 461 is stretched. When the chamber 464 is deflated, the elastic string 461 automatically contracts to collapse the chamber 464. Also, the frames 483, 484 are deflated to collapse the chamber 481.
Referring to FIG. 5A, an inflatable product of a fifth embodiment of the present invention includes two inflatable chambers 51, 52, an air pump assembly 53 and a two-way valve device 54. The air pump assembly 53 is used to inflate the chambers 51 and 52 via the two-way valve device 54, wherein the two-way valve device 54 is connected to the chamber 52 via a pipe 55. Also referring to FIGS. 5B and 5C, the air pump assembly 53 has a motor switch 533 and an air intake 531 on its front surface, and an air outlet 532 on its rear surface. The two-way valve device 54 has a valve switch 543 on its front surface, an air intake 541 and an air outlet 542 on its rear surface. During inflation, the user turns the motor switch 533 to pump air into the chamber 51 through the air intake 531 and air outlet 532. To further inflate the chamber 52, the valve switch 54 is turned on so that air in the chamber 51 flows into the chamber 52 through the two-way valve device 54.
Referring to FIG. 6, an inflatable product of a sixth embodiment of the present invention includes two inflatable chambers 61, 62 and an air pump assembly 63. The air pump

assembly 63 includes the chambers 61, 62 via two check valves 64, 65, respectively. The air pump assembly 63 has a fan and motor 633, a valve switch 631 and a cantilever arm 632 connected to the valve switch 631. To inflate the chamber 61, the user twists the valve switch 631 so that the cantilever arm 632 depresses the valve 64. The valve 64 is thus opened. Arrows indicate the path of airflow. Similarly, the user twists the valve switch 631 to open the valve 65 by the cantilever arm 632, when the chamber 62 is inflated.
Referring to FIG. 7A, an inflatable product of a seventh embodiment of the present invention includes four inflatable chambers 711, 712, 713, 714, an air pump 72, a first control pack 73 for controlling the air pump 72 to inflate the chambers 711, 712, and a second control pack 74 for controlling the air pump 72 to inflate the chambers 713, 714. Referring to FIG. 7B, the first control pack 73 has a pump body 730, two switches 731, 732, an air intake 733 connected to the air pump 72 and two air outlets 734, 735 respectively connected to the chambers 712, 713. Referring to FIG. 7C, the second control pack 74 has the same structure as the first control pack 73. The second control pack 74 has a pump body 740, two switches 741, 742, an air intake 743 connected to the air pump 72 and two air outlets 744, 745 respectively connected to the chambers 713, 714. Referring to FIGS. 7D, the switch 731 is connected to a valve 711 while a micro switch 7312 is provided beside the switch 731. When the switch 731 is rotated to the "INFLATE" position, the valve 7311 is opened and the micro switch 7312 is turned on as shown in FIG. 7E. Other switches 732, 741, 742 have the same structure as the switch 731, thereby having micro switches beside. Further referring to FIG. 7F, when any of the micro switches 7312, 7322, 7412, 7422 is turned on, a relay 75 is activated and turned on. Then, the air pump 72 is supplied with power to inflate the corresponding chambers 711, 712, 713, 714.
FIG. 7G depicts a modified control circuit of FIG. 7F, wherein reference numerals 7312', 7322', 7412', 7422' represent air bulbs instead of micro switches. When any of the air bulbs 7312', 7322', 7412', 7422' is pressed, a pressure switch 75 is turned on. Then, the air pump 72 is supplied with power to inflate the corresponding chambers 711, 712, 713, 714.
FIGS. 8A, 8B and 8C show an air pump assembly in accordance with an eighth embodiment of the present invention, wherein FIG. 8A is the front view of the operating panel of the air pump assembly, FIG. 8B is the front view of the air pump with the operating panel removed, and FIG. 8C is a bottom view of FIG. 8C. The air pump assembly includes a pack 81 with an air pump 811 on its top and two vents 812, 813 on its bottom surface. The air pump 811 is connected to the pack 81, two valves 83, 84 for opening/closing the vents 812 and 813, two switches 85, 86 and an elongated slider 87 provided beside the switches 85, 86. The elongated slider 87 has two slots 876, 877 with pins 872, 873 received inside, while the pins 872, 873 are firmly fixed in the pack 81. By the arrangement, the slider 87 is slidable with respect to the pins 872, 873. Furthermore, the fan and motor 82 have two pairs of electrodes 824, 824' and 825, 825'. The electrodes 824, 825 are fixed to the fan and motor 82. The electrodes 825' are firmly connected to the slider 87. When the slider 87 is moved to the right, the pair of electrodes 824, 824' is physically contacted each other. Then, the fan and motor 82 is activated to rotate in a normal direction. When the slider 87 is moved to the left, the pair of electrodes 825, 825' is physically contacted each other. Then, the fan and motor 82 is activated to rotate in a reverse direction. Furthermore, the

switches 85, 86 have ears 851, 852, 861, 862 to push the slider 87 in different directions.
During inflation, the switch 85, for example, is rotated to "INFLATE". The valve 83 connected to the switch 85 is opened. Meanwhile, the ear 851 of the switch 85 pushes against the slider 87 so that the pair of electrodes 824, 824' physically contact each other. Thus, the fan and motor 82 is activated to pump air from the top vent 811 to the bottom vent 812. When the ear 851 of the switch 85 is pushed against the slider 87, the ear 852 of the switch 85 pushes against the lever 871 so that the pair of electrodes 825, 825' contact each other and the pair of electrodes 824, 824' separate. Then, the fan and motor 82 operates in reverse to pump air from the bottom vent 812 to the top vent 811. Similarly, air is pumped from the top vent 811 to the bottom vent 813 when the switch 86 is rotated to "INFLATE". On the other hand, air is pumped from the bottom vent 813 to the top vent 811 when the switch 86 is rotated to "DEFLATE".
Referring to FIG. 9A, an inflatable product of a ninth embodiment of the present invention is an umbrella. The umbrella has a stiff handle 91 and an inflatable (flexible) shaft 92. An air pump is arranged in the handle 91 to pump the inflatable shaft 92. The air pump has a nozzle 95, bellows 94 for supplying the shaft 92 with air via the nozzle 95, and a motor 93 for operating the bellows 94 via gears 901 and a link 902. Furthermore, a ring switch 99 is provided around the handle 91 to activate the motor 93. In addition, three check valves 96, 97, 98 are provided to control the airflow. The first check valve 97 for controlling the entrance of air into the bellows 94 is provided under the ring switch 99. The second check valve 96 for controlling the exit of air from the inflatable shaft 92 is provided over the ring switch 99. The third check valve 98 is provided between the bellows 94 and the nozzle 95 for controlling the airflow from the bellows 94 to the shaft 92.
On the top and bottom of the ring switch 99 are provided a plurality of recesses. Referring to FIG. 9B, during inflation, the ring switch 99 is rotated to such a position that a top recess 991 of the ring switch 99 is positioned under the check valve 96, allowing the check valve 96 to be closed. Meanwhile, the check valve 97 is opened by the bottom of the ring switch 99. Also, a bottom recess 992 of the ring switch 99 is positioned over the button 931 of the motor 93 to release the button 931. Then, the motor 93 operates the bellows 94 via the gears 901 and link 902. Glide air is pumped into the shaft 92 through the check valves 97, 98. The path of airflow is indicated by arrows.
To stop the inflating operation, the user rotates the ring switch 99 to the position shown in FIG. 9C, wherein the top recess 991 of the ring switch 99 is still positioned under the check valve 96 so that the check valve 96 is closed. Another bottom recess 994 of the ring switch 99 is positioned over the check valve 97 so that the check valve 97 is closed. Also, the bottom of the ring switch 99 pushes the button 931 to stop the motor 93.
To deflate the umbrella, the user rotates the ring switch 99 to the position shown in FIG. 9D, wherein the bottom recess 994 of the ring switch 99 is still positioned over the check valve 97 so that the check valve 97 is closed. The bottom of the ring switch 99 continues pushing the button 931 so that the motor 93 is still at rest. The top of the ring switch 99 pushes the check valve 96 so that the check valve 96 is opened. Then, air in the shaft 92 of the umbrella automatically flows out through the check valve 96.
FIGS. 10A and 10B show a modified inflatable umbrella, wherein the air pump of the ninth embodiment including the

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FIG. 9C is an expanded view of the inflatable product of FIG. 9A, in stop mode;
FIG. 9D is an expanded view of the inflatable product of FIG. 9A, during deflation;
FIG. 10A shows a modified inflatable umbrella of the ninth embodiment of the present invention;
FIG. 10B is a perspective diagram of a fan assembly of FIG. 10A;
FIG. 11 is an exploded perspective diagram of a conventional air mattress.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to FIGS. 1A and 1B, an inflatable product of a first embodiment of the present invention has an inflatable chamber 10, a pump seat 11 mounted on the chamber 10, an air pump 12 carried by the pump seat 11, two holding elements 13, 13' to hold the air pump 12, and two covers 14, 14' for covering the vents 131, 131' provided on the holding elements 13. Referring to FIG. 1C, the seat 11 has two holes 111, 112 on its bottom, through which air enters the chamber 10. The air pump 12 has a substantially rolling-pin-shaped housing with a fan and motor (not shown) inside. An air intake 121 and an air outlet 122 are provided at opposite ends of the housing. The housing of the air pump 12 has a rib 123 on its outer surface, wherein the rib 123 extends in the axial direction of the housing. Referring to FIG. 1D, the air pump 12 is carried by the seat 11 with the rib 123 resting on the seat 11. Then, the holding elements 13 are screwed to the seat 11 for holding the air pump 12.

During inflation, the air pump 12 pumps air into the inflatable product. Air flows through the vent 131 of the holding element 13, the air intake 121 and air outlet 122 of the air pump 12, and the hole 112 on the bottom of the seat 11. Air then flows into the inflatable product via the hole 112 on the bottom of the seat 11.
During deflation, the air pump 12 is rotated in direction X until the rib 123 rests on the seat 11 at another side. As shown in FIG. 1E, the air intake 121 faces down and the air outlet 122 faces up so that the air pump 12 can pump air out of the inflatable product. Air flows through the hole 111 of the seat 11, the air intake 121 and air outlet 122 of the air pump 12, and then out from the vent 131' of the holding element 13'.

Referring to FIG. 2A, an inflatable product of a second embodiment of the present invention is provided with a rotatable switch 21, an air pump 22, a piping system 23 and a cover 24. On the top surface of the switch 21, "INFLATE", "STOP", and "DEFLATE" settings appear. The air pump 22 is firmly connected to the switch 21. The air pump 22 thus follows the switch 21's rotation when twisted. Referring to FIG. 2B, the air pump 22 has a substantially rolling-pin-shaped housing 225 with a fan and motor 223 inside. An air intake 221 and an air outlet 222 are provided at opposite ends of the housing. The piping system 23 includes a main pipe 238, two side pipes 236, 237 and a vent 239. The main pipe 238 is connected to the outside via the vent 239 and connected to the air pump 22 in the housing 225 via the side pipes 236, 237. The cover 24 is used to close the vent 239.

During inflation, the switch 21 is rotated to "INFLATE". The air intake 221 is switched to connect the side pipe 236, while the side pipe 237 is closed by the housing 225 of the air pump 22. The air pump 22 pumps air into the inflatable product in accordance with a path indicated by arrows. In detail, air flows through the vent 239, main pipe 238, side pipe 236 and air intake 221, and out from the air outlet 222.

Referring to FIG. 3A, an inflatable product of a third embodiment of the present invention is provided with a rotatable switch 31, an air pump 32, a piping system 33 and a cover 34. On the top surface of the switch 31, "INFLATE", "STOP", and "DEFLATE" settings appear. The air pump 32 is firmly connected to the switch 31. The air pump 32 thus follows the switch 31's rotation when twisted. Referring to FIG. 3B, the air pump 32 has a substantially rolling-pin-shaped housing 325 with a fan and motor 323 inside. An air intake 321 and an air outlet 322 are provided at opposite ends of the housing. The piping system 33 includes a main pipe 338, two side pipes 336, 337 and a vent 339. The main pipe 338 is connected to the outside via the vent 339 and connected to the air pump 32 in the housing 325 via the side pipes 336, 337. The cover 34 is used to close the vent 339.

During inflation, the switch 31 is rotated to "INFLATE". The air intake 321 is switched to connect the side pipe 336, while the side pipe 337 is closed by the housing 325 of the air pump 32. The air pump 32 pumps air into the inflatable product in accordance with a path indicated by arrows. In detail, air flows through the vent 339, main pipe 338, side pipe 336 and air intake 321, and out from the air outlet 322.

Referring to FIG. 4A, an inflatable product of a fourth embodiment of the present invention is provided with a rotatable switch 41, an air pump 42, a piping system 43 and a cover 44. On the top surface of the switch 41, "INFLATE", "STOP", and "DEFLATE" settings appear. The air pump 42 is firmly connected to the switch 41. The air pump 42 thus follows the switch 41's rotation when twisted. Referring to FIG. 4B, the air pump 42 has a substantially rolling-pin-shaped housing 425 with a fan and motor 423 inside. An air intake 421 and an air outlet 422 are provided at opposite ends of the housing. The piping system 43 includes a main pipe 438, two side pipes 436, 437 and a vent 439. The main pipe 438 is connected to the outside via the vent 439 and connected to the air pump 42 in the housing 425 via the side pipes 436, 437. The cover 44 is used to close the vent 439.

During inflation, the switch 41 is rotated to "INFLATE". The air intake 421 is switched to connect the side pipe 436, while the side pipe 437 is closed by the housing 425 of the air pump 42. The air pump 42 pumps air into the inflatable product in accordance with a path indicated by arrows. In detail, air flows through the vent 439, main pipe 438, side pipe 436 and air intake 421, and out from the air outlet 422.

Referring to FIGS. 3C and 3D, during deflation, the switching pipe 32 is switched from the air outlet 312 to the air intake 311 on the top surface of the housing 31. Also, the flap 36 follows the switching pipe 32 to rotate to close the air outlet 313 on the bottom surface of the housing 31. The air in the inflatable product is evacuated by the fan and motor 33. The path of the airflow is indicated by arrows. Air flows through the air intake 314, the switching pipe 32 and the air intake 311, and into the housing 31. Then, air flows out from the air outlet 312.
Referring to FIG. 4A, an inflatable product of a fourth embodiment of the present invention is an air mattress which includes a mattress pad 41, a back support 42 and an air pump assembly 43 built into the mattress pad 41 to inflate the mattress pad 41 and the back support 42. The back support 42 is inflated to raise the backrest of the mattress pad 41. Referring to FIGS. 4B and 4C, the air pump assembly 43 has a pack 430, a fan and motor 435 received in the pack 430, a motor switch 433 mounted on the pack 430 to activate the fan and motor 435, two valves 436, 436' disposed in the pack 430, and two valve switches 431, 431' for opening/closing the valves 436, 436'. The pack 430 has an air intake 4301, a first air outlet 4302 connected to the air intake 4301, and a second air outlet 4302' connected to the mattress pad 41. The valve switches 431, 431' have the same structure. Therefore, only the valve switch 431' is introduced and the description of the valve switch 431 is omitted. The valve switch 431 has a cap 4311, a cam element 4312, a bar 4313 and a spring 4314. The cam element 4312 is firmly connected to the cap 4311. When the cap 4311 is twisted, the cam element 4312 follows the cap 4311's rotation. Referring to FIG. 4D, the cam element 4312 has a recess 4314 on its bottom, via which the cam element 4312 sits on the bar 4313.

To inflate the back support 42, the user turns on the motor switch 433 to activate the fan and motor 435. In addition, the user turns on the valve switch 431 by twisting the cap 4311. The cam element 4312 follows the cap 4311's rotation as shown in FIG. 4D. Then, the bar 4313 is depressed by the

When inflation is finished, the user rotates the switch 21 to "STOP". The air pump 22 stops. Also, the air intake 221 and air outlet 222 are closed by the housing 225 of the air pump 22.
During deflation, the switch 21 is rotated to "DEFLATE". As shown in FIG. 2C, the air outlet 222 is rotated to connect the side pipe 237, while the side pipe 236 is closed by the housing 225 of the air pump 22. The air pump 22 evacuates air from the inflatable product in accordance with a path as indicated by arrows. In detail, air flows through the air intake 221, air outlet 222, side pipe 237 and main pipe 238, and out from the vent 239.
Referring to FIGS. 3A and 3B, an inflatable product of a third embodiment of the present invention is provided with a housing 31, a fan and motor 33, a switching pipe 32, a flap 36 and a cover 35. The fan and motor 33 is received in the housing 31. The flap 36 is firmly connected to the switching pipe 32. Therefore, when the switching pipe 32 is rotated, the flap 36 follows. An air intake 311 and an air outlet 312 are provided on the top surface of the housing 31, while another air intake 314 and air outlet 313 are provided on the bottom surface of the housing 31. During inflation, the switching pipe 32 is connected to the air outlet 312 on the top surface of the housing 31. The cover 35 is removed from the air intake 311. The inflatable product (not shown) is inflated by the fan and motor 33. Air flows through the air intake 311 and the air outlet 313, and into the inflatable product.

Referring to FIGS. 3C and 3D, during deflation, the switching pipe 32 is switched from the air outlet 312 to the air intake 311 on the top surface of the housing 31. Also, the flap 36 follows the switching pipe 32 to rotate to close the air outlet 313 on the bottom surface of the housing 31. The air in the inflatable product is evacuated by the fan and motor 33. The path of the airflow is indicated by arrows. Air flows through the air intake 314, the switching pipe 32 and the air intake 311, and into the housing 31. Then, air flows out from the air outlet 312.

Referring to FIG. 4A, an inflatable product of a fourth embodiment of the present invention is an air mattress which includes a mattress pad 41, a back support 42 and an air pump assembly 43 built into the mattress pad 41 to inflate the mattress pad 41 and the back support 42. The back support 42 is inflated to raise the backrest of the mattress pad 41. Referring to FIGS. 4B and 4C, the air pump assembly 43 has a pack 430, a fan and motor 435 received in the pack 430, a motor switch 433 mounted on the pack 430 to activate the fan and motor 435, two valves 436, 436' disposed in the pack 430, and two valve switches 431, 431' for opening/closing the valves 436, 436'. The pack 430 has an air intake 4301, a first air outlet 4302 connected to the air intake 4301, and a second air outlet 4302' connected to the mattress pad 41. The valve switches 431, 431' have the same structure. Therefore, only the valve switch 431' is introduced and the description of the valve switch 431 is omitted. The valve switch 431 has a cap 4311, a cam element 4312, a bar 4313 and a spring 4314. The cam element 4312 is firmly connected to the cap 4311. When the cap 4311 is twisted, the cam element 4312 follows the cap 4311's rotation. Referring to FIG. 4D, the cam element 4312 has a recess 4314 on its bottom, via which the cam element 4312 sits on the bar 4313.

To inflate the back support 42, the user turns on the motor switch 433 to activate the fan and motor 435. In addition, the user turns on the valve switch 431 by twisting the cap 4311. The cam element 4312 follows the cap 4311's rotation as shown in FIG. 4D. Then, the bar 4313 is depressed by the

While the invention has been described by way of example and in terms of the preferred embodiment, it is to be understood that the invention is not limited to the disclosed modifications and similar arrangements (as would be apparent to those skilled in the art). Therefore, the scope of the appended claims should be accorded the broadest interpretation so as to encompass all such modifications and similar arrangements.

What is claimed is:
1. An inflatable product including:
an inflatable body;
a fan and motor assembly for pumping air;
a housing built into the inflatable body, the housing having an interior region;
an air conduit disposed at least in part in the housing, the air conduit being movable between a first position and a second position while remaining disposed at least in part in the housing, the fan and motor inflating the inflatable body when the air conduit is in the first position, and deflating the inflatable body when the air conduit is in the second position;
wherein air flows between the interior region of the housing and the inflatable body during inflation and deflation.

2. The inflatable product as claimed in claim 1, wherein air flows from the interior region of the housing into the inflatable body when the air conduit is in the first position.
3. The inflatable product as claimed in claim 1, wherein air flows from the inflatable body into the interior region of the housing when the air conduit is moved to the second position.
4. The inflatable product as claimed in claim 1, wherein the air conduit is a pipe.
5. The inflatable product as claimed in claim 4, wherein the pipe is rotatable.
6. The inflatable product as claimed in claim 4, wherein the pipe is a switching pipe.
7. The inflatable product as claimed in claim 1, wherein the air conduit is arranged to convey air pumped by the fan and motor assembly.
8. The inflatable product as claimed in claim 7, wherein the air conduit has a first end and a second end, and wherein the fan and motor assembly causes air to be conveyed from the first end of the air conduit to the second end of the air conduit when the air conduit is in the first position.
9. The inflatable product as claimed in claim 8, wherein the fan and motor assembly causes air to be conveyed in sequence from ambient, through the first end of the air conduit, to the second end of the air conduit, and into the inflatable body when the air conduit is in the first position.
10. The inflatable product as claimed in claim 8, wherein the fan and motor assembly causes air to be conveyed from

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the second end of the air conduit to the first end of the air conduit when the air conduit is in the second position.

11. The inflatable product as claimed in claim 10, wherein the fan and motor assembly causes air to be conveyed in sequence from the inflatable body, through the second end of the air conduit, to the first end of the air conduit, to ambient when the air conduit is in the second position.

12. The inflatable product as claimed in claim 1, wherein the fan and motor are received in the housing.

13. An inflatable product including:

an inflatable body;

a housing built into the inflatable body, having a first opening and a second opening;

a fan and motor for pumping air; and

a switching pipe disposed at least in part in the housing

and having a first end and a second end, the switching

pipe movable between a first position and a second

position, the switching pipe arranged such that the first

end of the switching pipe communicates with the first

opening when the switching pipe is in the first position,

and the first end of the switching pipe communicates

with the second opening when the switching pipe is in

the second position; wherein, on activation of the fan,

air is pumped in sequence from the second opening to

the first opening and through the switching pipe from

the first end to the second end when the switching pipe

is in a first position, and air is pumped is pumped in

sequence from the second end to the first end of the

switching pipe and through the second opening to the

first opening when the switching pipe is in the second

position.

14. The inflatable product as claimed in claim 13, wherein

the housing comprises an interior region, and air flows

between the interior region of the housing and the inflatable

body when the inflatable body is inflated and deflated.

15. The air pump assembly recited in claim 13, wherein

the fan and motor are received in the housing.

16. An inflatable product including:

an inflatable body;

a fan and motor assembly for pumping air;

a housing built into the inflatable body, the housing

having an interior region; and

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an air conduit having a first end and a second end, the air conduit disposed at least in part in the housing and

arranged to convey air pumped by the fan and motor

assembly, the air conduit being movable between a first

position and a second position, the fan and motor

inflating the inflatable body when the air conduit is in

the first position, and deflating the inflatable body when

the air conduit is in the second position;

wherein air flows between the interior region of the

housing and the inflatable body during inflation and

deflation, and

wherein the fan and motor assembly causes air to be

conveyed from the first end of the air conduit to the

second end of the air conduit when the air conduit is in

the first position, and the fan and motor assembly

causes air to be conveyed in sequence from the inflat-

able body, through the second end of the air conduit, to

the first end of the air conduit, to ambient when the air

conduit is in the second position.

17. The inflatable product as claimed in claim 16, wherein

air flows from the interior region of the housing into the

inflatable body when the air conduit is in the first position.

18. The inflatable product as claimed in claim 16, wherein

air flows from the inflatable body into the interior region

of the housing when the air conduit is moved to the second

position.

19. The inflatable product as claimed in claim 16, wherein

the air conduit is a pipe.

20. The inflatable product as claimed in claim 19, wherein

the pipe is rotatable.

21. The inflatable product as claimed in claim 19, wherein

the pipe is a switching pipe.

22. The inflatable product as claimed in claim 16, wherein

the fan and motor assembly causes air to be conveyed in

sequence from ambient, through the first end of the air

conduit, to the second end of the air conduit, and into the

inflatable body when the air conduit is in the first position.

23. The inflatable product as claimed in claim 16, wherein

the fan and motor are received in the housing.

* * * * *







Electronic Proof of Claim

Final Audit Report

2019-04-10

Created:	2019-04-10
By:	Sears Claims (searsclaims@primeclerk.com)
Status:	Signed
Transaction ID:	CBJCHBCAABAAnk0a4LyhuBZeyo9Vhn9mkOI63mhGqJls

"Electronic Proof of Claim" History

-  Widget created by Sears Claims (searsclaims@primeclerk.com)
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-  Kenneth Wang (ken.wang@twwcorp.com) uploaded the following supporting documents:
 -  Attachment
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2019-04-10 - 2:28:22 PM GMT- IP address: 38.104.61.14
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2019-04-10 - 2:28:24 PM GMT- IP address: 38.104.61.14
-  Signed document emailed to Kenneth Wang (ken.wang@twwcorp.com) and Sears Claims (searsclaims@primeclerk.com)
2019-04-10 - 2:28:24 PM GMT